PROPOSED RETAIL BUILDING
(SHELL ONLY, UN-OCCUPIED)
2219 EL CAMINO REAL
REDWOOD CITY, CALIFORNIA 94063

CODE ANALYSIS

RETAIL BUILDING : M OCCUPANCY, TYPE V-B
(UN-OCCUPIED)
(SPRINKLED)

APPLICABLE CODES

CBC 2022
CMC 2022
CPC 2022
CEC 2022
CFC 2022

CA. GREEN BUILDING STANDARDS (CALGREEN) 2022

CA. ENERGY CODE 2022

2010 ADAAG

CITY OF REDWOOD CITY MUNICIPAL CODE

MIXED OCCUPANCY CALCULATIONS (TABLE 504.3, 504.4 & 506.2)

OCCUPANCY	AREA OCCUPANCY SQ. FT.	FIRE SPRINKLERS (TYPE V-B)	ALLOWABLE			OCCUPANCY RATIO	BUILDING HEIGHT
			AREA	# OF STORIES	HEIGHT		
RETAIL BLDG.: "M"	2,630	YES	2,630 / 36000	1	40 FT.	0.073	20'-0"
TOTAL	2,630					0.073 < 1 (OK)	

SEPARATE / DEFERRED SUBMITTALS

1. BUILDING AND SITE SIGNAGE SHALL BE BY SEPARATE PERMIT.
2. AN AUTOMATIC FIRE EXTINGUISHING (SPRINKLER) SYSTEM SHALL BE INSTALLED IN THE RETAIL BUILDING. THE AUTOMATIC SPRINKLER SYSTEM IS A DESIGN BUILT SYSTEM & SHALL BE DESIGNED & INSTALLED UNDER SEPARATE PERMIT. THE DESIGN & DRAWINGS FOR THE AUTOMATIC SPRINKLER SYSTEM SHALL BE SUBMITTED BY A C-16 LICENSED FIRE SPRINKLER CONTRACTOR, TO THE FIRE DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. ALL AUTOMATIC SPRINKLER SYSTEMS SHALL BE SUPERVISED BY AN APPROVED CENTRAL STATION SERVICE. MONITORING SYSTEMS SHALL CONFORM TO N.F.C. STANDARDS 70, 72 AND CALIFORNIA FIRE CODE REQUIREMENTS. THE SUB-CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND IS REQUIRED TO SUBMIT SEPARATE PLANS AND MAKE ARRANGEMENTS FOR ALL PERMITS, INSPECTIONS AND TESTS.
4. FIRE ALARM AND EMERGENCY RESPONDER RADIO COVERAGE SYSTEM SHALL BE A DEFERRED SUBMITTAL TO THE FIRE DEPARTMENT. ⚠1
5. ROOF TRUSS SHOP DRAWINGS SHALL BE A DEFERRED SUBMITTAL.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CALIFORNIA CODE OF REGULATION (CCR) TITLE 24, PART 1 THROUGH PART 12 AS-WELL-AS WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, LAWS AND STATUES. NOTHING CONTAINED IN THE DRAWINGS OR SPECIFICATIONS IS TO BE CONSTRUED AS REQUIRING WORK CONTRARY TO THESE CODES OR REGULATIONS.
2. DO NOT SCALE DRAWINGS. N.T.S. INDICATES "NOT TO SCALE" AND THE LISTED DIMENSION SHALL GOVERN.
3. ALL DIMENSIONS ARE TO "FACE OF STUD" U.O.N. EXTERIOR WALL DIMENSIONS ARE TO "FACE OF CONCRETE FOUNDATION" OR "CMU" U.O.N. FLOOR SINK DIMENSIONS ARE TO "FACE OF CONCRETE FOUNDATION" U.O.N. ALL MINIMUM, AND CLEAR DIMENSIONS ARE TO AND FROM "FACE OF FINISH".
4. THE DRAWINGS INDICATE LOCATIONS, DIMENSIONS, REFERENCE, AND PARTICULAR DETAILS OF THE CONSTRUCTION. THE DRAWINGS DO NOT ILLUSTRATE EVERY CONDITION. WORK NOT SPECIFICALLY DETAILED SHALL BE OF CONSTRUCTION SIMILAR TO THE PORTIONS THAT ARE DETAILED.
5. DETAILED AND LARGER SCALE DRAWINGS TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS. IF DISCREPANCIES OCCURS, NOTIFY THE ARCHITECT FOR RESOLUTION.
6. THE CONTRACTOR SHALL NOTIFY OWNER/ARCHITECT IMMEDIATELY IF THE SITE CONDITIONS OR DIMENSIONS DISAGREE WITH INFORMATION SHOWN ON THE DRAWINGS, SPECIFICATIONS, OR SCOPE OF WORK SUMMARY. WORK IS NOT TO PROCEED UNTIL SUCH DIFFERENCES ARE RESOLVED.
7. CALCULATED DIMENSIONS SHALL TAKE PRECEDENCE. IF DISCREPANCIES OCCURS, NOTIFY THE ARCHITECT FOR RESOLUTION.
8. THE CONTRACTOR SHALL PROTECT ALL EXISTING ITEMS AND FACILITIES TO REMAIN THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL REPAIR AND OR REPLACE, AT CONTRACTORS EXPENSE, ANY EXISTING ITEM AND FACILITIES TO REMAIN THAT ARE DAMAGED BY THE CONTRACTOR'S OPERATION TO SATISFACTION OF THE OWNER.
9. THE CONTRACTOR SHALL DEEMED TO HAVE INSPECTED THE SITE AND EXISTING BUILDING (S) PRIOR TO ENTERING INTO ANY AGREEMENT WITH THE OWNER FOR CONSTRUCTION, AND IS SATISFIED AS TO THE TRUE CONDITIONS UNDER WHICH WORK IS TO BE PERFORMED.
10. PRIOR TO EXCAVATION, DETERMINE AND VERIFY LOCATION OF UTILITY SERVICES IN ALL AREAS TO BE EXCAVATED.
11. THE CONTRACTOR IS RESPONSIBLE FOR OVERALL CONSTRUCTION SITE CLEANNESS, INCLUDING PROVISIONS OF A DEBRIS BOX WITH WEEKLY SERVICING, REMOVAL OF ALL CONTRACTOR / SUBCONTRACTOR REFUSE AND DEBRIS, AND SWEEPING OF THE ENTIRE YARD AREA AT THE COMPLETION OF WORK.
12. THE CONTRACTOR SHALL AT ALL TIMES DURING THE COURSE OF CONSTRUCTION, KEEP THE BUILDING AND PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS AND RUBBISH.
13. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRS OF DAMAGE TO THE WORK OF OTHER TRADES CAUSED BY HIS OPERATIONS. THE NATURE OF SUCH WORK SHALL RECEIVE THE APPROVAL OF THE OWNER.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL SUBCONTRACTOR'S WORK AND COMPLETION OF ALL SHOWN OR REASONABLY IMPLIED.
15. CONTRACTOR TO PERFORM ALL OPERATIONS SO AS TO MINIMIZE IMPACT TO THE NORMAL OPERATION AND USE OF THE FACILITY.
16. ALL BUILDING DRAINAGE GUTTERS, DOWN SPOUTS, VENTS, AND SIMILAR ELEMENTS LOCATED ON THE EXTERIOR WALLS SHALL BE COMPLETELY CONCEALED FROM VIEW OR SHALL BE ARCHITECTURALLY COMPATIBLE WITH THE EXTERIOR BUILDING DESIGN AND COLOR.
17. SIGNIFICANT CHANGES OR DEVIATIONS FROM THE INTENT OF THE CONSTRUCTION DOCUMENTS DURING CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS SUCH CHANGES ARE APPROVED PRIOR TO IMPLEMENTATION BY THE ARCHITECT.
18. IF THE CONSTRUCTION DOCUMENTS DOES NOT INCLUDE MECHANICAL , PLUMBING AND ELECTRICAL DRAWINGS, THEN ALL PLUMBING AND ELECTRICAL WORK TO BE DONE ON A DESIGN /BUILT BASIS. CONTRACTOR TO PROVIDE ALL LABOR AND MATERIALS REQUIRED TO DESIGN AND INSTALL THE NEW SYSTEM OR MODIFICATIONS TO THE EXISTING SYSTEM.
19. THE CONTRACTOR IS RESPONSIBLE TO SEE THAT WORK IN THE FIELD IS DONE IN ACCORDANCE WITH CURRENT APPLICABLE NATIONAL, STATE, CODES ORDINANCES & REQUIREMENTS BY GOVERNING AGENCIES & MANUFACTURERS SPECIFICATIONS, WHETHER OR NOT SAID CODES, ORDINANCES , REQUIREMENTS ARE SPECIFICALLY SHOWN ON DRAWINGS AND OR CALLED FOR IN SPECIFICATIONS OR UNLESS GREATER REQUIREMENTS ARE NECESSARY FOR THE SAFETY OF THE PROJECT.
20. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION, INCLUDING, BUT NOT LIMITED TO SAFETY OF ALL PERSONS AND PROPERTY. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ARCHITECT HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT.
21. GEOTECHNICAL ENGINEERING INVESTIGATION REPORT PREPARED BY MATRISCOPE ENGINEERING LABORATORIES, INC. PROJECT NO.: 2567, DATED JANUARY 8, 2016 & GEOTECHNICAL REPORT UPDATE LETTER DATED AUGUST 1, 2023. SAID REPORT & UPDATE LETTER ARE A PART OF THE CONSTRUCTION DOCUMENTS. ALL DRAWINGS & DOCUMENTS SHALL CONFORM TO THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEERING INVESTIGATION REPORT & UPDATE LETTER. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND/OR OWNER IMMEDIATELY IF ANY DISCREPANCIES ARISE BETWEEN THESE DOCUMENTS.

SCOPE OF WORK

TO BE REMOVED AND/OR RELOCATED:

- REMOVE PARKING STRIPING AS NECESSARY TO ACCOMMODATE NEW WORK
- REMOVE PORTIONS OF EXISTING CONCRETE PLANTER CURB & LANDSCAPING AS NECESSARY TO ACCOMMODATE NEW WORK
- REMOVE A PORTION OF EXISTING RAISED CONCRETE WALK ADJACENT TO EXISTING CONVENIENCE STORE AS NECESSARY TO ACCOMMODATE NEW WORK
- REMOVE EXISTING ASPHALT PAVING IN THE AREA WHERE THE NEW RETAIL SHELL BUILDING WILL BE LOCATED
- REMOVE AND/OR RELOCATED EXISTING SEWER CLEAN-OUT AS NECESSARY TO ACCOMMODATE NEW WORK
- RELOCATE EXISTING STORM DRAIN DROP INLET AS NECESSARY TO ACCOMMODATE NEW WORK
- REMOVE AND RELOCATE EXISTING SELF-SERVICE VACUUM EQUIPMENT AS NECESSARY TO ACCOMMODATE NEW WORK

TO REMAIN (PROTECT DURING CONSTRUCTION):

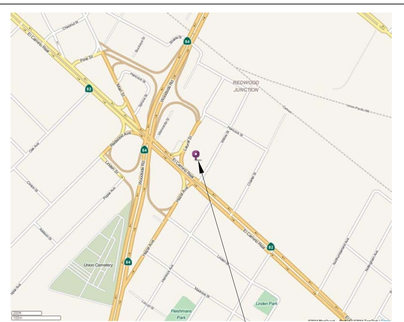
- ALL EXISTING SITE IMPROVEMENTS

NEW CONSTRUCTION AND/OR EQUIPMENT TO BE INSTALLED:

- CONSTRUCT A 2,630 SF RETAIL SHELL BUILDING (UN-OCCUPIED)
- CONSTRUCT A 14'-8" H x 11'-4" D x 6'-0" H MASONRY TRASH ENCLOSURE W/ SOLID METAL ROOF & GATES
- INSTALL NEW ELECTRICAL MAIN SWITCHBOARD CABINET
- INSTALL TWO (2) NEW SHORT TERM BICYCLE RACKS TO ACCOMMODATE FOUR (4) BICYCLES
- INSTALL ONE (1) NEW ELECTRICAL VEHICLE CHARGING PARKING STALL
- INSTALL ONE (1) NEW ACCESSIBLE PARKING STALL
- INSTALL TWO (2) STANDARD PARKING STALLS
- INSTALL THREE (3) PARALLEL PARKING STALLS
- INSTALL NEW 1,200 GALLON UNDERGROUND GREASE INTERCEPTOR
- INSTALL NEW FIRE SPRINKLER RISER (INSIDE THE RETAIL BUILDING)
- RE-INSTALL EXISTING SELF-SERVICE VACUUM EQUIPMENT

⚠1 A PRE-SITE INSPECTION SHALL BE PERFORMED PRIOR TO ANY DEMOLITION OR CONSTRUCTION WORK, PER REDWOOD CITY BUILDING OFFICIAL POLICY.

VICINITY MAP



NORTH

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PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION
-		ISSUED FOR CONSTRUCTION
04-24-23		ISSUED FOR PLAN CHECK
10-21-14		ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
⚠1	11-14-23	REVISED PER PLAN CHECK COMMENTS
⚠2	01-24-24	REVISED PER PLAN CHECK COMMENTS
⚠		
⚠		
⚠		

COVER SHEET

PROJECT #: 18-10002
DRAWN: jm CHECKED: MII
SCALE: AS NOTED DATE: 04-14-23

CS.1

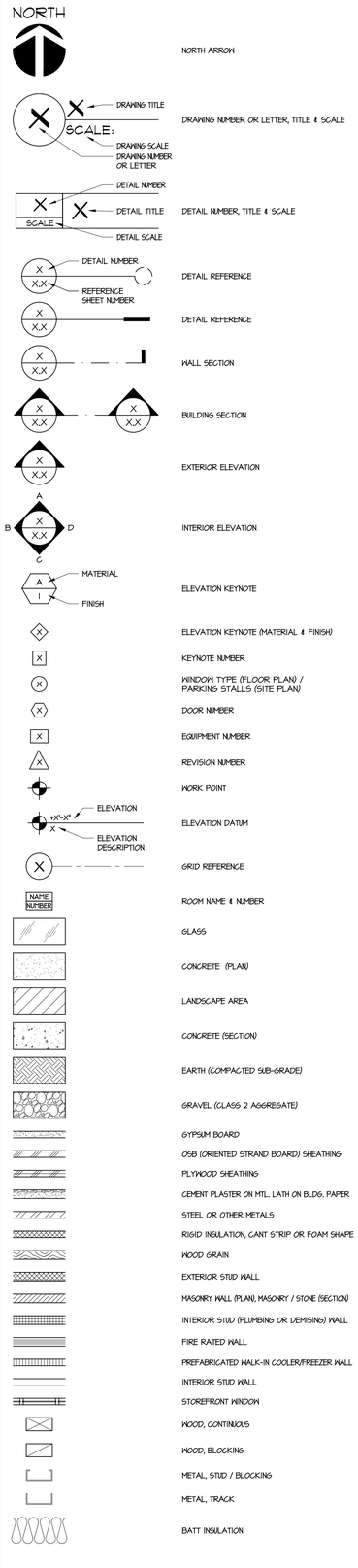
SHEET OF

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ABBREVIATIONS

AB.	ANCHOR BOLT	MEZZ.	MEZZANINE
AC.	ASPHALTIC CONCRETE	MFD.	MANUFACTURED
ACM.	ALUMINUM COMPOSITE METAL	MFR.	MANUFACTURER
ACST.	ACOUSTIC	MH.	MANHOLE
A.D.	AREA DRAIN	MIN.	MINIMUM
ADJ.	ADJUSTABLE	MIR.	MIRROR
AFG.	ABOVE FINISHED GRADE	MISC.	MISC.
AFF	ABOVE FLOOR FINISH	MO.	MASONRY OPENING
AGGR.	AGGREGATE	MOD.	MODULAR
ALUM.	ALUMINUM	MR.	MOISTURE RESISTANT
APPROX.	APPROXIMATE	MTD.	MOUNTED
ARCH.	ARCHITECTURAL	MTG.	MOUNTING
ASB.	ASBESTOS	MTL.	METAL
ASPH.	ASPHALT	MUL.	MULLION
ATG	AUTOMATIC TANK GAUGE		
AVG.	AVERAGE	N.	NORTH
		N.I.C.	NOT IN CONTRACT
BD.	BOARD	NO.	NUMBER
BITUM.	BITUMINOUS	NOM.	NOMINAL
BLDG.	BUILDING	N.T.S.	NOT TO SCALE
BLKG.	BLOCKING		
BM.	BEAM	OBS.	OBSCURE
BOT.	BOTTOM	O.C.	ON CENTER
BRG.	BEARING	OD.	OUTSIDE DIAMETER
BRZ.	BRONZE	OF.	OUTSIDE FACE
BTM.	BOTTOM	OFF.	OFFICE
BTWN.	BETWEEN	OH.	OPPOSITE HAND
		OPG.	OPENING
CAB.	CABINET	OPNG.	OPENING
CB.	CATCH BASIN	OS.	OPPOSITE
CBM.	CEMENT	OSB.	ORIENTED STRAND BOARD
CER.	CERAMIC	OVRFLW	OVERFLOW
CI.	CAST IRON		
C.J.	CONTROL JOINT	PAR.	PARALLEL
CLG.	CEILING	PASS.	PASSENGER
CLKG.	CAULKING	PERP.	PERPENDICULAR
CLO.	CLOSET	PL.	PLATE OR PROPERTY LINE
CLR.	CLEAR	P. LAM.	PLASTIC LAMINATE
C.MU.	CONCRETE MASONRY UNIT	PLAS.	PLASTER
		PLU.	PRESSURIZED LINE LEAK DETECTOR
C.O.	CASED OPENING	PLMB.	PLUMBING
COL.	COLUMN	PLSTC.	PLASTIC
CONC.	CONCRETE	PLYWD.	PLYWOOD
CONN.	CONNECTION	POC	POINT OF CURVE
CONST.	CONSTRUCTION	PR.	PAIR
CONT.	CONTINUOUS	PRCST.	PRECAST
CONTR.	CONTRACTOR	PROP.	PROPERTY
CORR.	CORRIDOR	PT.	PRESSURE TREATED
CTSNK.	COUNTERSINK	PT.DF.	PRESURE TREATED
CNTR.	COUNTER		DOUGLAS FIR
CTR.	CENTER		PAPER TOWEL DISPENSER
		P.T.D.	PARTITION
DBL.	DOUBLE	PTN.	PRESSURE / VACUUM
DEPT.	DEPARTMENT	P/V	
DTL.	DETAIL	QT.	QUARRY TILE
DF.	DOUGLAS FAIR	Q.S.R.	QUICK SERVE RESTAURANT
DGGS	DENSGLASS GOLD SHEATHING		
DIA.	DIAMETER	R	RADIUS OR RISER
DIAG.	DIAGONAL	RD.	ROOF DRAIN
DIM.	DIMENSION	RECT.	RECTANGLE
DISP.	DISPENSER	RED.	REDUCER
DN.	DOWN	REF.	REFERENCE OF
DO.	DOOR OPENING		REFRIGERATOR
DR.	DOOR	RF.	ROOF
DWR.	DRAWER	REGTR.	REGISTER
D.S.	DOWNSPOUT	REINF.	REINFORCED OR
DWG.	DRAWING		REINFORCING
		REQ'D	REQUIRED
E.	EAST	RESIL.	RESILIENT
EA.	EACH	REV.	REVISION
EJ.	EXPANSION JOINT	R.H.WS.	ROAND HEAD
EL.	ELEVATION		WOOD SCREW
ELEC.	ELECTRICAL	RM.	ROOM
ELEV.	ELEVATOR	RO.	ROUGH OPENING
ELID.	ENHANCED LEAK DETECTION	RUB.	RUBBER
EMER.	EMERGENCY	RWD.	REDWOOD
ENCL.	ENCLOSURE	RWL.	RAIN WATER LEADER
ENGR.	ENGINEER		
ENT.	ENTRANCE	S.	SOUTH
EP.	ELECTRICAL PANEL	SC.	SOLID CORE
EQ.	EQUAL	SCHED.	SCHEDULE
EQUIP.	EQUIPMENT	SCHEM.	SCHEMATIC
EST.	ESTIMATE	SD.	STORM DRAIN
EVR	ENHANCED VAPOR RECOVERY	SECT.	SECTION
EW	EACH WAY	SGD	SLIDE GLASS DOOR
EWC.	ELECTRIC WATER COOLER	SH.	SHELF
EXP.	EXPANSION	SHWR.	SHOWER
EXT.	EXTERIOR	SHT.	SHEET
		SHTG.	SHEATHING
FD.	FLOOR DRAIN	SIM.	SIMILAR
FDN.	FOUNDATION	S.N.D.	SANITARY NAPKIN
FE.	FIRE EXTINGUISHER		DISPENSER
FEC.	FIRE HOSE CABINET	SPA.	SPACE OR SPACING
FHS.	FLAT HEAD SCREW	SPEC.	SPECIFICATION
FHWS.	FLAT HEAD WOOD SCREW	SPR.	SPRINKLER
FIN.	FINISH	SQ.	SQUARE
FIN. FLR.	FINISH FLOOR	STN. STL.	STAINLESS STEEL
FIX.	FIXTURE	STAG.	STAGGERED
FLG.	FLOORING	STD.	STANDARD
FLR.	FLOOR	STL.	STEEL
FLASH	FLASHING	STOR.	STORAGE
FLUOR.	FLUORESCENT	STR	SIPHON TEST PORT
F.O.C.	FACE OF CONCRETE	STRUCT.	STRUCTURAL
F.O.F.	FACE OF FILL	SUSP.	SUSPENDED
F.O. CMU	FACE OF CONCRETE MASONRY UNIT	SYM.	SYMETRICAL
F.O. OSB	FACE OF OSB	SED.	SEE ELECTRICAL DRAWINGS
F.O. PLYWD.	FACE OF PLYWOOD	SCD.	SEE CIVIL DRAWINGS
F.O.S.	FACE OF STUDS	SLD.	SEE LANDSCAPING DRAWINGS
FPRF.	FIREPROOF	SMD.	SEE MECHANICAL DRAWINGS
FRMG.	FRAMING	SPD.	SEE PLUMBING DRAWINGS
FRP.	FIBERGLASS REINF. PLASTIC	SSD.	SEE STRUCTURAL DRAWINGS
FS.	FLOOR SINK	TEL.	TELEPHONE
FT.	FEET	TEMP.	TEMPERED
FTG.	FOOTING	T.O.	TOP OF
FURR.	FURRING	T.O.C.	TOP OF CONCRETE
		T.O.C.C.	TOP OF CONCRETE CURB
GA.	GAUGE	T.O.P.	TOP OF PAVEMENT
GALV.	GALVANIZED		OR PLATE
GB.	GRAB BAR	T.O.S.	TOP OF STEEL OR TOP OF SHEATHING
GEN.	GENERAL OR GENERATOR	T.O.W.	TOP OF WALL
GD	GARBAGE DISPOSAL	TRD.	TREAD
GC	GENERAL CONTRACTOR OR GARBAGE COMPACTOR	T.B.	TOWEL BAR
		TRR.	TERRAZZO
GL.	GALVANIZED IRON	TYS	TONGUE & GROOVE
GL.	GLASS	THK.	THICK
GL.GR.	GLASS GRADE	T.P.D.	TOILET PAPER DISPENSER
GR.	GRADE	T.S.	TUBE STEEL
GSH	GALVANIZED SHEET METAL	TV.	TELEVISION
GYP.	GYPSUM	TYP.	TYPICAL
GYP. BD.	GYPSUM BOARD		
		UDC	UNDER DISPENSER CONTAINMENT
HB.	HOSE BIBB	UNF.	UNFINISHED
HC.	HOLLOW CORE OR HANDICAPPED	U.O.N.	UNLESS OTHERWISE NOTED
		UR.	URINAL
HDR.	HEADER	UST	UNDERGROUND STORAGE TANK
HDW.	HARDWARE		
HDWD.	HARDWOOD	VENT.	VENTILATE OR VENTILATION
HM.	HOLLOW METAL	VERT.	VERTICAL
HORIZ.	HORIZONTAL	VEST.	VESTIBULE
HR.	HOUR	V.FLG.	VINYL FLOORING
HT.	HEIGHT	V.W.C.	VINYL WALL COVERING
I.F.	INSIDE FACE	W	WEST
ISD	IN-STATION DIAGNOSTICS	W/	WITH
IN.	INCH	WC.	WATER CLOSET
INFO.	INFORMATION	WD.	WOOD
INSUL.	INSULATION	W.F.	WIDE FLANGE
INT.	INTERIOR	WH	WATER HEATER
INTER.	INTERMEDIATE	W/O	WITHOUT
		WP.	WATERPROOF
JAN.	JANITOR	W.PT.	WORK POINT
JST.	JOIST	WRBGT.	WAINSCOT
JT.	JOINT	WT.	WEIGHT
KIT.	KITCHEN	WWF.	WELDED WIRE FABRIC
K.P.	KICK PLATE		
		∠	ANGLE
LAM.	LAMINATED	@	AT
LAV.	LAVATORY	℄	CENTERLINE
LIF.	LINEAL FEET	C	CHANNEL
L	LONG	⌀	DIAMETER
LGTH.	LENGTH	⊥	PERPENDICULAR
LT.	LIGHT	#	PER
LT. HT.	LIGHT HEIGHT	□	SQUARE
		(E)	EXISTING
MAT.	MATERIAL	(N)	NEW
MAX.	MAXIMUM	(R)	RELOCATED
MB	MACHINE BOLT		
MC.	MEDICINE CABINET		
MECH.	MECHANICAL		
MED.	MEDIUM		
MEMB.	MEMBRANE		

LEGEND



NORTH ARROW

DRAWING NUMBER OR LETTER, TITLE & SCALE

DETAIL NUMBER, TITLE & SCALE

DETAIL REFERENCE

DETAIL REFERENCE

WALL SECTION

BUILDING SECTION

EXTERIOR ELEVATION

INTERIOR ELEVATION

ELEVATION KEYNOTE

ELEVATION KEYNOTE (MATERIAL & FINISH)

KEYNOTE NUMBER

WINDOW TYPE (FLOOR PLAN) / PARKING STALLS (SITE PLAN)

DOOR NUMBER

EQUIPMENT NUMBER

REVISION NUMBER

WORK POINT

ELEVATION DATUM

GRID REFERENCE

ROOM NAME & NUMBER

GLASS

CONCRETE (PLAN)

LANDSCAPE AREA

CONCRETE (SECTION)

EARTH (COMPACTED SUB-GRADE)

GRAVEL (CLASS 2 AGGREGATE)

GYPSUM BOARD

OSB (ORIENTED STRAND BOARD) SHEATHING

PLYWOOD SHEATHING

CEMENT PLASTER ON MTL. LATH ON BLDG. PAPER

STEEL OR OTHER METALS

RIGID INSULATION, CANT STRIP OR FOAM SHAPE

WOOD GRAIN

EXTERIOR STUD WALL

MASONRY WALL (PLAN), MASONRY / STONE (SECTION)

INTERIOR STUD (PLUMBING OR DEMISING) WALL

FIRE RATED WALL

PREFABRICATED WALK-IN COOLER/FREEZER WALL

INTERIOR STUD WALL

STOREFRONT WINDOW

WOOD, CONTINUOUS

WOOD, BLOCKING

METAL, STUD / BLOCKING

METAL, TRACK

BATT INSULATION

CONDITIONS OF APPROVAL

CITY OF REDWOOD CITY CONDITIONS OF APPROVAL

2215 El Camino Real
AP2021-052 Architectural Permit

The following Conditions of Approval [COA] and Standard Development Requirements [SDR] apply to this project. The COAs are specific conditions applicable to the proposed project. The SDRs are items which are codified or adopted by resolution and have been included for ease of reference, they may not be appealed or changed. The SDRs are not intended as a comprehensive list. The COAs and SDRs are grouped under specific headings that relate to the subject matter and the responsible division is described in brackets, i.e. [PLANNING].

The applicant is responsible for the fulfillment of all conditions and standard development requirements, unless specifically stated otherwise.

In addition to complying with all applicable City, County, State and Federal Statutes, Codes, Ordinances, Resolutions and Regulations, Permittee expressly accepts and agrees to comply with the following Conditions of Approval and Standard Development Requirements of this Permit:

Building Permit

1. **Approval Letter & Conditions in Building Permit Plans -** This Notice of Official Action, with the accompanying conditions of approval, shall be printed on the first page of the plans submitted to the Building Division for a building permit. [COA][PLANNING]

2. **Bicycle Parking –** The plans show one bicycle parking space. The Building Permit plans shall also include 1 bicycle parking space. [COA][ENGINEERING]

Fire Department

3. **Construction Permits.** Individual building and fire code permit reviews will be required on all demolitions, remodels, tenant improvements, and new construction in accordance with the legally adopted codes and standards in place at the time of the permit application. [COA][FIRE]

4. **Emergency Responder Radio Coverage System (ERRCS).** An emergency responder radio coverage system (ERRCS) is required [CFC Sec. 510.1]. Provide plans and calculations in accordance with NFPA 72 Chapter 7 Documentation and NFPA 1221, Standard for Installation, Maintenance, and Use of Emergency Services Communications Systems, as a deferred submittal for the design of the emergency responder radio coverage system (ERRCS). [COA][FIRE]

5. **Public Safety Key Boxes.** Approved Knox key boxes must be located adjacent to each building entrance [CFC sec. 506.1]. The public safety key boxes must be recessed and installed adjacent to each entrance within 60 to 72 inches of the finished walking surface. Each public safety key box must contain four sets of keys, with each set containing a key for building access, fire equipment room access, fire cache room, elevator keys, utility room keys, and other keys essential for emergency operations. [COA][FIRE]

6. **Fire Apparatus Access Roads.** An approved fire apparatus access road must be provided such that no portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet from fire apparatus access as measured by an approved route around the exterior of the building [CFC §503.1.1]. [COA][FIRE]

7. **Fire Flow.** A minimum required fire flow for manual suppression for this project cannot be less than 1,500 gallons per minute at 20 psi residual pressure for two hours [CFC §507.1]. [COA][FIRE]

8. **Fire Hydrant Sprinkler System Feed Lines.** All water mains providing a water supply for fire protection, both to fire hydrants and to fire service systems, must be not less than eight inches in diameter. [CFC §507.1.1 as amended by the City of Redwood City Code of Ordinances §12.16]. [COA][FIRE]

9. **Automatic Fire Sprinkler System.** All new buildings or structures, with a total floor area of three thousand (3,000) square feet or more are required to be equipped with an automatic fire sprinkler system. [CFC §903.2.13 and §12.18 of the Redwood City Municipal Code] Provide plans and hydraulic calculations as a deferred submittal for the design of the fire sprinkler system. [COA][FIRE]

10. **Fire Hydrant Placement and Fire Department Connection (FDC).** Buildings equipped with a standpipe system installed in accordance with CFC §905 or a fire sprinkler system complying with CFC §903.3.1.1 must have a fire hydrant within 50-feet of the fire department connection and locate on the same side of the roadway. [CFC §507.5.1 as amended by the City] [COA][FIRE]

11. **Fire Alarm System.** A fully addressable fire alarm system is required to be installed throughout the building, and in compliance with the building permit date contemporary edition NFPA 72, National Fire Alarm and Signaling Code. The fire alarm system must also be supervised by an Underwriters Laboratories certified central station monitoring service. Provide plans and calculations in accordance with NFPA 72 Chapter 7 Documentation as a deferred submittal for the design of the fire alarm system and identify the company providing supervising services. [COA][FIRE]

12. **Premise Identification – Address numbers.** All buildings must be provided with address identification that is legible and placed in a position that is visible from the street or road facing the street from which the building takes the address, numbers to be a minimum size of 12-inches in height, with contrasting background, and all address numbers to be illuminated and visible from the street during darkness. [CFC § 505.1 and City of Redwood City Code, Ordinances §9.48] [COA][FIRE]

13. **Portable Fire Extinguishers.** Portable fire extinguishers, with a minimum classification of 2A:10B:C are required to be permanently installed throughout all buildings within 75 feet of travel from all portions of the building in compliance with CFC §906. [COA][FIRE]

Fees

The following fees shall be paid in full prior to issuance of the building permit.

14. **Transportation Impact Fee** - Pay Traffic Impact fee for the net new trips resulting from the proposed project, estimated at $2,472.20. Please note this is an estimate and the fee is formally assessed at the time of building permit issuance. [SDR] [ENGINEERING]

15. **Parks Impact Fee –** -The estimated Parks Impact Fee for 2,630 square feet of retail is $14,209.36. This amount is based on a rate of $5.40 per square foot and an administrative fee of $191.46. Please note this is an estimate and the fee is formally assessed at the time of building permit issuance. [SDR][PARKS]

16. **School Impact Fee –** For residential additions greater than 500 square feet, pay a School Impact Fee to the Sequoia Union High School District. Information regarding this fee may be obtained by contacting the Sequoia Union High School District at (650) 369-1411. [SDR][SCHOOL DISTRICT]

17. **Water Fees –** Pay applicable water, recycled water, and wastewater-related fees as outlined on the City's website. [SDR][ENGINEERING]

18. **Notice Of Fees Protest –** The applicant may protest any fees, dedications, reservations, or other exactions imposed by the City as part of the approval or as a condition of approval of this development. Per California Government Code Section 66020, this 90-day protest period has begun as of the date of the approval of this application. [SDR][OFFICE OF THE CITY ATTORNEY]

Civil Engineering and Transportation Standards

19. **Stormwater Runoff** – Post-Construction runoff into the storm drain shall not exceed pre-construction runoff levels. Applicant shall prepare a grading and drainage plan that demonstrates the project complies with the previously approved grading/drainage design at 2215 El Camino Real (Gas Station/Car Wash). [SDR] [ENGINEERING]

20. **Bicycle Parking** – Provide one (1) short-term bicycle parking and demonstrate this on the building permit plans. [COA][ENGINEERING]

21. **Electric Vehicle Charging Spaces** – Provide for and install one (10 Electric Vehicle Charging Spaces.

22. **Accessible Parking** – Provide one (1) accessible space and one (1) van accessible space, including considerations for signage and time limits. Demonstrate this on the building permit plans. [COA][ENGINEERING]

23. **Geotechnical Report** – Include a geotechnical field review and reports for all grading work, prepared by a licensed geotechnical engineer and in conformance with Engineering Standards, Volumes II & III, CBC, and other State regulations. This shall be submitted as part of the building permit application. [SDR][ENGINEERING]

24. **As-Builts** – Provide "as-built" or "record" drawings, to be submitted in paper, PDF and AutoCAD formats prior to project sign-off. [COA][ENGINEERING]

25. **Conformance with the City's Engineering Standards** – All public improvements shall be designed and constructed in accordance with the City's Engineering Standards. [SDR][ENGINEERING]

26. **Encroachment Permits** – Obtain an Encroachment Permit from the Engineering and Transportation Division for work listed below. This permit shall be obtained prior to the commencement of construction of the road, utilities, or any site improvements. [SDR][ENGINEERING]
    a. Work in the City public right-of-way, easements or property in which the City holds an interest.
    b. Work requiring a grading permit. Grading permits require a Plot and Finished Grading Plan prepared by a California-registered Civil Engineer.

27. **Sewer Capacity** – Prior to encroachment permit issuance, submit to the City, and obtain approval of, an evaluation and report prepared by a licensed engineer demonstrating that the existing sewer mains have sufficient capacity for the project. The study shall consider existing, project, other approved projects, and applications currently under review in determining the needed capacity. If the existing sewer main is less than 6" in size, or is in any other way not sufficient as determined by the City Engineer, applicant shall, as part of the Project, construct and install new sewer mains sufficient to meet such requirements, in accordance with the City's Engineering standards and as directed by the City Engineer to the City Engineer's satisfaction. [SDR][ENGINEERING]

28. **Peak Wet Weather Flow Capacity –** Redwood City has exceeded its Peak Wet Weather Flow (PWWF) capacity in the past. A methodology to reduce inflow and infiltration (I/I) by pipe replacement was determined. The applicant shall reduce (I/I) to offset increased sewer demand from the project by replacing aged sewer mains or pay an equivalent in-lieu fee. The length of pipe replacement required or the amount of fee will be based on the project's sewage generation projection (Attachment L of the City's Engineering Standards). For parcels within Redwood City but connecting to County owned and maintained sewer, an I/I in-lieu fee may be collected by Redwood City if the County does not require main replacement or collect and in-lieu fee. [COA][ENGINEERING]

29. **Sewer Lateral Limit** – The project is limited to one sewer lateral per parcel. [COA][ENGINEERING]

30. **Sewer Lateral Size for Commercial Development** – For new or remodeled commercial buildings, sewer laterals less than 4" shall be upgraded to a minimum 6" size. [SDR] [ENGINEERING]

31. **Water Meters** – The project is limited to one "master" water meter for domestic water service. Any metering for individual units must be accomplished by private sub-meters within the property. [COA][ENGINEERING]

32. **Backflow Protection** – Backflow protection on all water services is required. The backflow preventer shall be above grade and located on private property, accessible to the Public Works division for testing. [COA][ENGINEERING]

33. **Fire Flow** – The Project shall meet fire flow requirements as established by the Fire Department which are based on the Fire Code. Fire flow tests are typically performed during the preliminary design phase but must be completed prior to submittal of final design. Applicant shall contact the Fire Department for fire flow requirements, and then submit a written fire flow test request to Engineering. [COA][ENGINEERING]

34. **Stormwater Management Plan (SWMP)** – Applicant shall prepare a SWMP that demonstrates the project complies with the previously approved grading/drainage design at 2215 El Camino Real (Gas Station/Car Wash). [COA][ENGINEERING]

35. **Stormwater BMPs –** Stormwater Pollution Prevention Program Best Management Practices (BMPs) for construction shall be implemented to protect water quality, in accordance with the approved Stormwater Pollution Prevention Plan (SWPPP). BMP plan sheets are available electronically for inserting into project plans. [SDR][ENGINEERING]

36. **Repair or Replace Street Infrastructure** – Restore streets surrounding the project site to the satisfaction of the City Engineer at project completion. When this requires additional pavement restoration, the Engineer shall approve the preferred layout of pavement markings. [SDR][ENGINEERING]

Construction-Related Activities

37. **Pre-Construction Meeting** – After City permits are approved, but prior to start of construction, hold a preconstruction conference with Engineering and Building staff and other interested parties. The developer shall arrange for the attendance of the construction manager, contractor, and all subcontractors who are responsible for grading and erosion and sedimentation protection controls. [COA][ENGINEERING]

38. **Construction Management and Staging** – Prior to encroachment permit issuance, submit a construction parking management plan, which shall outline the number of construction workers by phase, phase duration, where parking will be located for each phase. Construction parking, material storage, equipment, or other construction-related uses are not allowed within the City right of way without prior approval from the City Engineer. [COA][ENGINEERING]

39. **Lane Closures** – Traffic control for lane closures shall conform to the Work Area Traffic Control Handbook. Street closures require submission of traffic control plans and approval in advance. [SDR][ENGINEERING]

40. **Winterizing** – If construction is not complete by the start of the wet season (October 1 through April 30), implement a winterization program to minimize the potential for erosion and sedimentation. As appropriate to the site and status of construction, winterization requirements shall include inspecting/maintaining/cleaning all soil erosion and sedimentation controls prior to, during, and immediately after each storm event; stabilizing disturbed soils through temporary or permanent seeding, mulching, matting, tarping or other physical means; rocking unpaved vehicle access to limit dispersion of much onto public right-of-way; and covering/tarping stored construction materials, fuels, and other chemicals. Plans to include proposed measures to prevent erosion and polluted runoff from all site conditions shall be submitted for approval by CDD prior to beginning construction. As site conditions warrant, the City Engineer may direct the applicant to implement additional winterization requirements. [COA][ENGINEERING]

41. **Grading** – Grading shall be performed in accordance with the City's Engineering Standards. Soil or other construction materials shall not be stockpiled in the public right-of-way. Submit cut/fill volumes (CY) for all soils to be imported to or exported from the site. [SDR][ENGINEERING]

42. **Monitoring** – The Soils Engineer shall conduct continuous site inspections during trenching and backfill operations at the applicant's expense. The Soils Engineer shall take compaction tests and submit the results to Engineering & Construction. [SDR][ENGINEERING]

43. **Transportation Demand Management Program** – A final Transportation Demand Management (TDM) program, describing the elements to be implemented, shall be reviewed and approved prior to certificate of building occupancy. The TDM program shall include an annual reporting requirement for the life of the project that details overnight parking utilization rates and resident use and awareness of the program. Annual reporting shall be made by January 31 of each year. [COA][ENGINEERING]

Other Agency Permits

44. **Caltrans** – If a portion of the proposed work is within the State of California right-of-way (Woodside Road, El Camino Real), the applicant shall contact the California Department of Transportation (Caltrans) at (510) 286-4417 to obtain all necessary Encroachment Permits. [SDR][ENGINEERING]

General Requirements

45. **Substantial Conformity -** Applicant shall ensure that all improvements substantially conform to the project plans prepared by MI Architects, submitted February 2nd, 2023, and related information submitted by the Applicant, on file with Planning Services. [COA][PLANNING]

46. **Signs –** Future signs require a separate sign permit and shall conform to the requirements of the Downtown Precise Plan and Chapter 3 of the Municipal Code. [SDR][PLANNING]

47. **Exterior Materials –** The exterior materials, colors, textures, trim elements, windows, and roof pitch of the project shall be consistent throughout. [COA][PLANNING]

48. **Modifications -** Modifications to the approved plans require Planning review and approval prior to building permit issuance. Minor project modifications required to meet building, fire, and safety codes at time of building permit plan check may be allowed, at the City's discretion. Substantial modification of approved plans, as determined by the Zoning Administrator, may be subject to an amendment or a new Permit. [COA][PLANNING]

49. **Hours of Construction –** Construction activity is permitted between 7:00 a.m. and 8:00 p.m. Monday through Friday, except as permitted on weekends by the Building Official. [SDR][BUILDING]

50. **Indemnification –** Per Redwood City Code Section 1.54, Applicant shall defend (with counsel approved by City), indemnify, and hold harmless the City, its agents, officers, and employees from and against any claim, action, or proceeding (including without limitation any appeal or petition for review thereof) against the City or its agents, officers or employees related to an approval of the Project, including without limitation any related application, permit, certification, condition, environmental determination, other approval, compliance or failure to comply with applicable laws and regulations, and/or processing methods ("Challenge"). City may (but is not obligated to) defend such Challenge as City, in its sole discretion, determines appropriate, all at applicant's sole cost and expense. Applicant shall bear any and all losses, damages, injuries, liabilities, costs, and expenses (including, without limitation, staff time and in-house attorney's fees on a fully-loaded basis, attorney's fees for outside legal counsel, expert witness fees, court costs, and other litigation expenses) arising out of or related to any Challenge ("Costs"), whether incurred by Applicant, City, or awarded to any third party, and shall pay to the City upon demand any Costs incurred by the City. No modification of the project, any application, permit, certification, condition, environmental determination, other approval, change in applicable laws and regulations, or change in processing methods shall alter the applicant's indemnity obligation. Per Government Code Section 66474.9, Applicant's indemnification obligation with respect to any Challenge concerning a subdivision (tentative, parcel, or final map application or approval) shall be limited to actions brought within the time period provided for in Government Code Section 66499.37, unless such time period is extended for any reason. The City shall promptly notify Applicant of any such claim, action or proceeding and shall cooperate fully in the defense. [COA][OFFICE OF THE CITY ATTORNEY]

[END]

MI Architects
MI Architects, Inc.
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NOT FOR CONSTRUCTION

PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

DRAWINGS AND SPECIFICATIONS AND THE CONCEPTS EMBODIED WITHIN THEM CONSTITUTE THE ORIGINAL UNPUBLISHED WORK OF MI ARCHITECTS, INC. AND THE SAME MAY NOT BE USED, DISCLOSED OR REPRODUCED WITHOUT THE WRITTEN CONSENT OF MI ARCHITECTS, INC. ANY UNAUTHORIZED USE, DISCLOSURE OR REPRODUCTION OF THE DOCUMENTS WITHOUT EXPRESSED WRITTEN CONSENT FROM MI ARCHITECTS, INC. IS PROHIBITED.

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

ABBREVIATIONS, LEGEND & CONDITIONS OF APPROVAL

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: NONE DATE: 04-18-23

CS.2

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwgs\Permitting\18-10002-CS.2.dwg modified by miousers1 at Sep 28, 2023 - 10:56am

2022 CALGREEN NON-RESIDENTAL CHECKLIST

CITY OF REDWOOD CITY
Community Development & Transportation Department
Building Division

1017 Middlefield Road
Redwood City, CA 94063
(650) 780-7360

2022 CALGREEN Non-Residential Checklist

PURPOSE:

The non-residential provisions of the 2019 CalGreen Code outline planning, design and development methods that include environmentally responsible site selection, building design, building siting and development to protect, restore and enhance the environmental quality of the site and respect the integrity of adjacent properties; establishes the means of conserving water used indoors, outdoors and in wastewater conveyance; outlines means of achieving material conservation and resource efficiency; and outlines means of reducing the quantity of air contaminants.

Project Name: PROPOSED RETAIL BUILDING
Project Address: 2219 EL CAMINO REAL
Project Description: CONTRUCT 2,630 RETAIL BUILDING (UN-OCCUPIED)

INSTRUCTIONS:

1. The Owner or the Owner's agent shall employ a licensed professional experienced with the 2019 California Green Building Standards Codes to verify and assure that all required work described herein is properly planned and implemented in the project.
2. The licensed professional, in collaboration with the owner and the design professional shall initial **Column 2** of this checklist, sign and date **Section 1 - Design Verification** at the end of this checklist and have the checklist printed on the approved plans for the project.
3. Prior to final inspection by the Building Division, the licensed professional shall complete **Column 3** and sign and date **Section 2 - Implementation Verification** at the end of this checklist and submit the completed form to the Building Inspector.

MANDATORY FEATURE OR MEASURE	COLUMN 2 Projection Requirements	COLUMN 3 Verification
CHAPTER 5 - NON-RESIDENTIAL MANDATORY MEASURES		
General Requirements		
Project meets all of the requirements of Divisions 5.1 through 5.5.		
DIVISION 5.1 - PLANNING AND DESIGN		
Site Development		
5.106.1 Storm water pollution prevention. Newly constructed projects and additions which disturb less than one acre of land shall prevent the pollution of stormwater runoff from the construction activities through local ordinance in Section 5.106.1.1 or Best management practices (BMP) in Section 5.106.1.2.	MP	
5.106.4 Bicycle parking. For buildings within the authority of California Building Standards Commission as specified in Section 103, comply with Section 5.106.4.1. For buildings within the authority of the Division of the State Architect pursuant to Section 105, comply with Section 5.106.4.2.	MJ	
5.106.4.1 Bicycle parking. [BSC-CG] Comply with Sections 5.106.4.1.1 and 5.106.4.1.2; or meet the applicable local ordinance, whichever is stricter.	N/A	

5.106.4.1.1 Short-term bicycle parking. If the new project or addition or alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack. **Exception:** Additions or alterations which add nine or less visitor vehicular parking spaces.	MJ	
5.106.4.1.2 Long-term bicycle parking. For buildings with 10 or more tenant-occupants or for additions or alterations that add 10 or more tenant vehicular parking spaces, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and shall meet one of the following: 1. Covered, lockable enclosures with permanently anchored racks for bicycles; 2. Lockable bicycle rooms with permanently anchored racks; or 3. Lockable, permanently anchored bicycle lockers. **Note:** Additional information on recommended bicycle accommodations may be obtained from Sacramento Area Bicycle Advocates.	N/A	
5.106.5.2 Designated parking. In new projects or additions or alterations that add 10 or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2.	N/A	
5.106.5.2.1 Parking stall marking. Paint, in the paint used for stall striping, the following characters such that the lower edge of the last word aligns with the end of the stall striping and is visible beneath a parked vehicle: CLEAN AIR VANPOOL/EV **Note:** Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces.	N/A	
5.106.5.3 Electric vehicle (EV) charging. [N] Construction shall comply with Section 5.106.5.3.1 or Section 5.106.5.3.2 to facilitate future installation of electric vehicle supply equipment (EVSE).	N/A	

5.106.8 Light pollution reduction. [N] Outdoor lighting systems shall be designed and installed to comply with the following: 1. The minimum requirements in the California Energy Code for Lighting Zones 0–4 as defined in Chapter 10 - 114 of the California Administrative Code; and 2. Backlight, Uplight and Glare (BUG) ratings as defined in IESNA TM-15-11; and 3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or 4. Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent. **Exceptions: [N]** 1. Luminaires that qualify as exceptions in Section 140.7 of the California Energy Code 2. Emergency lighting 3. Building facade meeting the requirements in Table 140.7-B of the California Energy Code, Part 6. 4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 5. Alternate materials, designs and methods of construction Note: [N] See also California Building Code, Chapter 12, section 1205.7 for college campus lighting requirements for parking facilities and walkways.	N/A	
5.106.10 Grading and paving. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include those shown in Items 1–5. See exception for additions or alterations.	MP	
DIVISION 5.2 - ENERGY EFFICIENCY		
Performance Requirements for Newly Constructed Buildings and Additions		
5.201.1 Scope. Building meets or exceeds the requirements of the California Building Energy Efficiency Standards. [3]	RB	
DIVISION 5.3 - WATER EFFICIENCY AND CONSERVATION		
Indoor Water Use		
5.303.1Meters. A Separate submeters or metering devices shall be installed for the uses described in Sections 503.1.1 and 503.1.2.	N/A	
5.303.1.1 Buildings in excess of 50,000 square feet. Separate submeters shall be installed as follows:	N/A	
1. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/380 L/day, including but not limited to, spaces used for laundry or cleaner, restaurant for food service, medical or dental office, laboratory or beauty salon or barber shop.	↓	
2. Where separate submeters for individual building tenants are unfeasible, for water supplied to the following subsystem:	↓	
a. Makeup water for cooling towers where flow through is greater than 500 gpm.	↓	
b. Makeup water for evaporative coolers greater than 6 gpm.	↓	
c. Steam and hot-water boilers with energy input more than 500,000 Btu/h (147 KW).	↓	

5.303.1.2 Excess consumption. A separate submeter or metering device shall be provided for any tenant within a new building or an addition that is projected to consume more than 1,000 gal/day.	N/A	
5.303.3 Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:	N/A	
5.303.3.1 Water closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush. Tank-type water closets shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank- Type Toilets. **Note:** The effective flush volume of dual flush toilets is defined as the composite, average flush volume of two reduced flushes and one full flush.	N/A	
5.303.3.2 Urinals. **5.303.3.2.1 Wall-mounted urinals.** The effective flush volume of wall mounted urinals shall not exceed 0.125 gallons per flush. **5.303.3.2.2 Floor-mounted urinals.** The effective flush volume of floor- mounted urinals shall not exceed 0.5 gallons per flush.	N/A	
5.303.3.3 Showerheads. **5.303.3.3.1 Single showerhead.** Showerheads shall have a maximum flow rate of not more than 1.8 gallons per minute at 80 psi. Showerheads shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Showerheads. **5.303.3.3.2 Multiple showerheads serving one shower.** When a shower is served by more than one showerhead, the combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi, or the shower shall be designed to allow only one shower outlet to be in operation at a time. **Note:** A hand-held shower shall be considered a showerhead.	N/A	
5.303.4 Commercial kitchen equipment. **5.303.4.1 Food waste disposers.** Disposers shall either modulate the use of water to no more than 1 gpm when the disposer is not in use (not actively grinding food waste/no-load) or shall automatically shut off after no more than 10 minutes of inactivity. Disposers shall use no more than 8 gpm of water. **Note:** This code section does not affect local jurisdiction authority to prohibit or require disposer installation.	N/A	
5.303.5 Areas of additions or alteration. For those occupancies within the authority of the California Building Standards Commission as specified in Section 103, the provisions of Section 5.303.3 and 5.303.4 shall apply to new fixtures in additions or areas of alterations to the building.	N/A	

CALGREEN 2022 NOTES

1. THE NEW CONSTRUCTION AND SITE IMPROVEMENTS SHALL COMPLY WITH THE REQUIREMENTS OF DIVISION 5.1 THOUGH 5.5.
2. CONTRACTOR TO PROVIDE TEMPORARY VENTILATION DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 121 OF THE CALIFORNIA ENERGY CODE, CCR, TITLE 24, PART 6, AND CHAPTER 4 OF CCR, TITLE 8, AND AS LISTED IN ITEMS 1 THROUGH 4 IN A5.504.1.1, AS FOLLOWS:
   a) VENTILATION DURING CONSTRUCTION SHALL BE ACHIEVED THROUGH OPENINGS IN THE BUILDING SHELL USING FANS TO PRODUCE A MINIMUM OF THREE AIR CHANGES PER HOUR.
   b) DURING DUST-PRODUCING OPERATIONS, PROTECT SUPPLY AND RETURN HVAC SYSTEM OPENINGS FROM DUST.
   c) THE PERMANENT HVAC SYSTEM SHALL ONLY BE USED DURING CONSTRUCTION IF NECESSARY TO CONDITION THE BUILDING WITHIN THE REQUIRED TEMPERATURE RANGE FOR MATERIALS AND EQUIPMENT INSTALLATION. IF THE HVAC SYSTEM IS USED DURING CONSTRUCTION, USE RETURN AIR FILTERS WITH A MINIMUM EFFICIENCY REPORTING VALUE (MERV) OF 8, BASED ON ASHRAE 52.2-1999 OR AN AVERAGE EFFICIENCY OF 30 PERCENT BASED ON ASHRAE 52.1-1992. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY.
   d) IF THE BUILDING IS OCCUPIED DURING DEMOLITION OF CONSTRUCTION, MEET OR EXCEED THE RECOMMENDED CONTROL MEASURE OF THE SHEET METAL AND AIR CONDITIONING NATIONAL CONTRACTORS ASSOCIATION (SMACNA) IAQ GUIDELINES FOR OCCUPIED BUILDING UNDER CONSTRUCTION, 1995, CHAPTER 3.
3. CONTRACTOR TO EMPLOY ADDITIONAL MEASURES AS LISTED IN ITEMS 1 THROUGH 5 IN A5.504.1.2, AS FOLLOWS:
   a) WHEN USING GENERATORS TO GENERATE TEMPORARY POWER, USE GENERATOR MEETING THE REQUIREMENTS OF CCR, TITLE 13, CHAPTER 9 OR THE LOCAL ORDINANCE, WHICHEVER IS MORE STRINGENT.
   b) PROTECT ON-SITE ABSORBENT MATERIALS FROM MOISTURE. REMOVE AND REPLACE ANY MATERIALS WITH EVIDENCE OF MOLD MILDEW OR MOISTURE INFILTRATION.
   c) STORE ODOROUS AND HIGH VOC-EMITTING MATERIALS OFF-SITE, WITHOUT PACKAGING, FOR A SUFFICIENT PERIOD TO ALLOW ODORS AND VOCS TO DISPERSE.
   d) WHEN POSSIBLE, ONCE MATERIALS ARE ON THE JOBSITE, INSTALL ODOROUS AND HIGH VOC-EMITTING MATERIALS PRIOR TO THOSE THAT ARE POROUS OR FIBROUS.
   e) CLEAN OIL AND DUST FROM DUSTS PRIOR TO USE.
4. AFTER ALL INTERIOR FINISHES HAVE BEEN INSTALLED, CONTRACTOR TO FLUSH OUT THE BUILDING BY SUPPLYING CONTINUOUS VENTILATION WITH ALL AIR HANDLING UNITS AT THEIR MAXIMUM POSITION AND RATE FOR AT LEAST 14 DAYS, PER SECTION A5.504.2 PRIOR TO OCCUPANCY.
   a) DURING THIS TIME, MAINTAIN AN INTERNAL TEMPERATURE OF AT LEAST 60° F AND RELATIVE HUMIDITY ON HIGHER THAN 60 PERCENT. IF EXTENUATING CIRCUMSTANCES MAKE THESE TEMPERATURE AND HUMIDITY LIMITS UNACHIEVABLE, THE FLUSH-OUT MAY BE CONDUCTED UNDER CONDITIONS AS CLOSE AS POSSIBLE TO THESE LIMITS, PROVIDED THAT DOCUMENTATION OF THE EXTENUATING CIRCUMSTANCES IS PROVIDED IN WRITING.
   b) OCCUPANCY MAY START AFTER 4 DAYS, PROVIDED FLUSH-OUT CONTINUOUS FOR THE FULL 14 DAYS. DURING OCCUPIED TIMES, THE THERMAL COMFORT CONDITIONS OF THE TITLE 24 MUST BE MET.
   c) FOR BUILDING THAT RELY ON NATURAL VENTILATION, EXHAUST FANS AND FLOOR FANS MUST BE USED TO IMPROVE AIR MIXING AND REMOVAL DURING THE 14 DAYS FLUSH-OUT AND WINDOWS SHOULD REMAINS OPEN.
   d) DO NOT "BAKE OUT" THE BUILDING BY INCREASING THE TEMPERATURE OF THE SPACE.
   e) (IF CONTINUOUS VENTILATION IS NOT POSSIBLE, FLUSH-OUT AIR MUST TOTAL THE EQUIVALENT OF 14 DAYS OF MAXIMUM OUTDOOR AIR.) THE EQUIVALENT OF 14 DAYS OF MAXIMUM OUTDOOR AIR SHALL BE CALCULATED BY MULTIPLYING THE MAXIMUM FEASIBLE AIR FLOW RATE (IN CFM). THE AIR VOLUMES FOR EACH PERIOD ARE THEN CALCULATED AND SUMMED AND THE FLUSH-OUT CONTINUES UNTIL THE TOTAL EQUALS THE TARGET AIR VOLUME.
5. AT THE TIME OF ROUGH INSTALLATION, OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL FINAL STARTUP OF THE HEATING AND COOLING EQUIPMENT, ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, SHEET METAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST OR DEBRIS WHICH MAY COLLECT IN THE SYSTEM AS PER CALGREEN 2022, SECTION 5.504.3.
6. PROHIBIT SMOKING WITHIN 25 FEET OF BUILDING ENTRIES, OUTDOOR AIR INTAKES AND OPERABLE WINDOWS WHERE OUTDOOR AREAS ARE PROVIDED FOR SMOKING, AND IN BUILDINGS OR AS ENFORCED BY ORDINANCES, REGULATIONS, OR POLICIES OF ANY CITY, COUNTY, CITY AND COUNTY, CALIFORNIA COMMUNITY COLLEGE, CAMPUS OF THE CALIFORNIA STATE UNIVERSITY, OR CAMPUS OF THE UNIVERSITY OF CALIFORNIA, WHICHEVER ARE MORE STRINGENT.
7. COVER DUCT OPENINGS AND PROTECT MECHANICAL EQUIPMENT DURING CONSTRUCTION. CGBS 5.504.3.
8. ADHESIVES, ADHESIVE BONDING PRIMERS, ADHESIVE PRIMERS, SEALANTS, SEALANT PRIMERS, CAULKS AND AEROSOL ADHESIVES AND SMALLER UNIT SIZES OF ADHESIVES AND SEALANT OR CAULKING COMPOUNDS SHALL COMPLY WITH VOC LIMITS. CGBS 5.504.4.
9. ARCHITECTURAL PAINTS AND COATINGS SHALL COMPLY WITH TABLE 5.504.4.3.
10. AEROSOL PAINTS AND COATINGS SHALL MEET CGBS 5.504.4.3.1. VERIFICATION OF COMPLIANCE SHALL BE PROVIDED.
11. ALL CARPET INSTALLED IN THE BUILDING INTERIOR SHALL:
    a) MEET THE TESTING AND PRODUCT REQUIREMENTS OF ONE OF THE STANDARDS LISTED IN CGBS 5.504.4.4.
    b) CARPET CUSHION SHALL MEET THE REQUIREMENTS OF THE CARPET AND RUG INSTITUTE GREEN LABEL PROGRAM CGBS 5.504.4.4.1
    c) ALL CARPET ADHESIVE SHALL MEET THE REQUIREMENTS OF CGBS TABLE 5.504.4.1.
12. HARDWOOD PLYWOOD, PARTICLE BOARD AND MEDIUM DENSITY FIBERBOARD COMPOSITE WOOD PRODUCTS USED ON THE INTERIOR OR EXTERIOR OF THE BUILDING SHALL MEET THE REQUIREMENTS FOR FORMALDEHYDE PER CGBS TABLE 4 SECTION 5.504.4.5. VERIFICATION OF COMPLIANCE SHALL BE PROVIDED.
13. RESILIENT FLOORING SYSTEMS SHALL COMPLY WITH THE VOC-EMISSION LIMITS PER CGBS 5.504.4.6. VERIFICATION OF COMPLIANCE SHALL BE PROVIDED.
14. IN MECHANICALLY VENTILATED BUILDINGS, PROVIDE REGULARLY OCCUPIED AREAS OF THE BUILDING WITH AIR FILTRATION MEDIA (MERV 13 MINIMUM) FOR OUTSIDE AND RETURN AIR PRIOR TO OCCUPANCY. CGBS 5.504.5.3.
15. FOR MECHANICALLY OR NATURALLY VENTILATED SPACES IN BUILDINGS; MEET THE MINIMUM REQUIREMENTS OF SECTION 121 OF THE CALIFORNIA ENERGY CODE AND CHAPTER 4 OF CCR, TITLE 8 OR THE APPLICABLE LOCAL CODE. CGBS 5.506.1.
16. INSTALL Co2 SENSORS AND VENTILATION CONTROLS FOR BUILDINGS EQUIPPED WITH DEMAND CONTROL VENTILATION. CGBS 5.506.2.
17. INSTALL HVAC OR REFRIGERATION EQUIPMENT THAT DOES NOT CONTAIN CFCS. CGBS 5.508.
18. INSTALL FIRE SUPPRESSION EQUIPMENT THAT DOES NOT CONTAIN CFCS AND HALONS. CGBS 5.508.
19. ANNULAR SPACES AROUND PIPES, ELECTRIC CABLES, CONDUITS, OR OTHER OPENING IN THE BUILDING'S ENVELOPE AT EXTERIOR WALLS SHALL BE PROTECTED AGAINST THE PASSAGE OF RODENTS BY CLOSING SUCH OPENING WITH CEMENT MORTAR, CONCRETE MASONRY, OR METAL PLATES. PIPING PRONE TO CORROSION SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 313.0 OF THE CALIFORNIA PLUMBING CODE.
20. AN OPERATION AND MAINTENANCE MANUAL INCLUDING, AT A MINIMUM, THE ITEMS LISTED IN SECTION 5.410, SHALL BE COMPLETED AND PLACED IN THE BUILDING AT THE TIME OF INSPECTION.
21. THE FORMALDEHYDE EMISSION VERIFICATION CHECK LIST SHALL BE COMPLETED PRIOR TO FINAL INSPECTION APPROVAL. THE MANUFACTURER'S SPECIFICATIONS SHOWING FORMALDEHYDE CONTENT FOR ALL APPLICABLE WOOD PRODUCTS SHALL BE READILY AVAILABLE AT THE JOB SITE AND BE PROVIDED TO THE FIELD INSPECTOR FOR VERIFICATION (5.504.4.5). THE VOC AND FORMALDEHYDE LIMITS CHECKLIST SHALL FOLLOW THE 2022 CGBSC, TABLE 5.504.4.5.
22. A CAPILLARY BREAK SHALL BE INSTALLED IF A SLAB ON GRADE FOUNDATION SYSTEM IS USED. THE USE OF A 4" THICK BASE OF 1/2" OR LARGER CLEAN AGGREGATE UNDER A 6 MIL VAPOR RETARDER WITH JOINT LAPPED NOT LESS THAN 6" WILL BE PROVIDED PER CGBSC 4.505.2 AND CRC R506.2.3.
23. BUILDING MATERIALS WITH VISIBLE SIGNS OF WATER DAMAGE SHALL NOT BE INSTALLED. WALL AND FLOOR FRAMING SHALL NOT BE ENCLOSED WHEN THE FRAMING MEMBERS EXCEED 19% MOISTURE CONTENT. MOISTURE CONTENT SHALL BE CHECKED PRIOR TO FINISH MATERIAL BEING APPLIED PER CGBSC 4.505.3.
24. ENHANCED CONSTRUCTION WASTE REDUCTION-TIER 1. DIVERT TO RECYCLE OR SALVAGE AT LEAST 65 PERCENT OF NON-HAZARDOUS CONSTRUCTION AND DEMOLITION WASTE GENERATED AT THE SITE.
25. RESILIENT FLOORING SYSTEMS, TIER 1. FOR 90% OF FLOOR AREA RECEIVING RESILIENT FLOORING, INSTALL RESILIENT FLOORING THAT IS:
    1- CERTIFIED UNDER THE RESILIENT FLOOR COVERING INSTITUTE FLOORSCORE PROGRAM,
    2- COMPLIANT WITH THE VOC-EMISSION LIMITS AND TESTING REQUIREMENTS SPECIFIED IN THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH'S 2010 STANDARD METHOD FOR THE TESTING AND EVALUATION CHAMBERS, VERSION 1.1, FEBRUARY 2010;
    3- COMPLIANT WITH THE COLLABORATIVE FOR HIGH PERFORMANCE SCHOOL CALIFORNIA (CA-CHPS) CRITERIA INTERPRETATION FOR EQ 7.0 AND EQ 7.1 (FORMERLY EQ 2.2) DATED JULY 2012 AND LISTED IN THE CHPS HIGH PERFORMANCE PRODUCT DATABASE; OR
    4- PRODUCT CERTIFIED UNDER UL GREENGUARD GOLD (FORMERLY THE GREENGUARD CHILDREN'S & SCHOOLS PROGRAM).
26. THERMAL INSULATION, TIER 1. COMPLY WITH THE FOLLOWING STANDARDS:
    1- CHAPTER 12-13 (STANDARD FOR INSULATING MATERIAL) IN TITLE 24, PART 12, THE CALIFORNIA REFERENCED STANDARD CODE,
    2- THE VOC-EMISSION LIMITS DEFINED IN 2009 CHPS CRITERIA AND LISTED ON ITS HIGH PERFORMANCE PRODUCTS DATABASE,
    3- CALIFORNIA DEPARTMENT OF PUBLIC HEALTH 2010 STANDARD METHOD FOR THE TESTING AND EVALUATION OF VOLATILE ORGANIC EMISSIONS FOR INDOOR SOURCES USING ENVIRONMENTAL CHAMBERS, VERSION 1.1, FEBRUARY 2010 (ALSO KNOWN AS SPECIFICATION 01350.)
27. CONTRACTOR TO DEVELOP A WRITTEN PLAN OF PROCEDURES FOR TESTING AND ADJUSTING SYSTEMS. SYSTEMS TO BE INCLUDED FOR TESTING AND ADJUSTING SHALL INCLUDE, AS APPLICABLE TO THE PROJECT:
    - RENEWABLE ENERGY SYSTEMS.
    - LANDSCAPE IRRIGATION SYSTEMS.
    - WATER REUSE SYSTEMS.
21. USE COMPOSITE WOOD PRODUCTS APPROVED BY THE CALIFORNIA AIR RESOURCES BOARD (ARB) AS NO-ADDED FORMALDEHYDE (NAF) BASED RESINS OR ULTRA-LOW EMITTING FORMALDEHYDE (ULEF) RESINS.
    NOTES:
    1- SEE TITLE 17, SECTION 93120.3(c) AND (d), RESPECTIVELY.
    2- DOCUMENTATION MUST BE PROVIDED VERIFYING THAT MATERIALS ARE CERTIFIED TO MEET THE POLLUTANT EMISSION LIMITS. A LIST OF MANUFACTURERS AND THEIR NAF AND ULEF CERTIFIED MATERIALS IS PROVIDED AT: HTTP://WWW.ARB.CA.GOV/TOXICS/COMPWOOD/NAF_ULEF/LISTOFNAF_ULEF.HTM.
28. CONTRACTOR TO ENSURE THAT RECYCLED CONTENT FOR 10% OF THE TOTAL MATERIAL COST IS MET, PER 2022 CGBSC, SECTION A5.405.4, A5.405.4.1 THROUGH A5.405.4.5.
29. DEVELOP A WRITTEN PLAN OF PROCEDURES FOR TESTING AND ADJUSTING SYSTEMS PER 2022 CGBSC, SECTION 5.410.4.2. SYSTEMS TO BE INCLUDED FOR TESTING AND ADJUSTING SHALL INCLUDE, AS APPLICABLE TO THE PROJECT:
    1- RENEWABLE ENERGY SYSTEMS.
    2- LANDSCAPE IRRIGATION SYSTEMS.
    3- WATER REUSE SYSTEMS.
30. USE OF AUTOMATIC LOAD MANAGEMENT SYSTEM (ALMS), PER 2022 CGBSC, SECTION A5.106.5.3.3. ALMS SHALL BE PERMITTED FOR EVCS. WHEN ALMS IS INSTALLED, THE REQUIRED ELECTRICAL LOAD CAPACITY SPECIFIED IN SECTION 5.106.5.3.1 FOR EACH EVCS MAY BE REDUCED WHEN SERVICED BY AN EVSE CONTROLLED BY AN ALMS. EACH EVSE CONTROLLED BY AN ALMS SHALL DELIVER A MINIMUM 30 AMPERES TO AN EV WHEN CHARGING ONE VEHICLE AND SHALL DELIVER A MINIMUM 3.3 KW WHILE SIMULTANEOUSLY CHARGING MULTIPLE EV'S.

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DRAWINGS AND SPECIFICATIONS ARE THE CONCEPTS & DESIGNS PREPARED WITHIN THEM CONSTITUTE THE ORIGINAL UNPUBLISHED WORK OF M I ARCHITECTS, INC. AND SHALL NOT BE USED BY ANY PERSON FOR ANY PURPOSE WHATSOEVER WITHOUT THE WRITTEN CONSENT OF M I ARCHITECTS, INC. IS PROHIBITED. THE USE, DUPLICATION OR DISCLOSURE OF THE DOCUMENTS WITHOUT EXPRESSED WRITTEN CONSENT FROM M I ARCHITECTS, INC. IS PROHIBITED.

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

CALGREEN 2022 NOTES & 2022 CALGREEN NON-RESIDENTIAL CHECKLIST

PROJECT #: 18-10002
DRAWN: JM CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

CS.3

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwgs\Permitting\18-10002-CS.3 - CS.5.dwg modified by mibusert at Sep 28, 2023 - 10:57am

5.303.6 Standards for plumbing fixtures and fittings. Plumbing fixtures and fittings shall be installed in accordance with the California Plumbing Code, and shall meet the applicable standards referenced in Table 1701.1 of the California Plumbing Code and in Chapter 6 of this code.	N/A	
Outdoor Water Use		
5.304.1 Scope. The provisions of Section 5.304 Outdoor Water Use reference the mandatory Model Water Efficiency Landscape Ordinance (MWELO) contained within Chapter 2.7, Division 2, Title 23, California Code of Regulations.3	N/A	
5.304.2 Outdoor water use in landscape areas equal to or greater than 500 square feet.[3] When water is used for outdoor irrigation for new construction projects with an aggregate landscape area equal to or greater than 500 square feet requiring a building or landscape permit, plan check or design review, one of the following shall apply: 1. A local water efficient landscape ordinance that is, based on evidence in the record, at least as effective in conserving water as the updated model ordinance adopted by the Department of Water Resources (DWR) per Government Code Section 65595 (c). 2. The California Department of Water Resources Model Water Efficient Landscape Ordinance (MWELO) commencing with Section 490 of Chapter 2.7, Division 2, Title 23, California Code of Regulations.	N/A	
5.304.3 Outdoor water use in rehabilitated landscape projects equal to or greater than 2,500 square feet. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review shall comply with Section 5.304.2, Item 1 or 2. [3]	N/A	
5.304.4 Outdoor water use in landscape areas of 2,500 square feet or less. Any project with an aggregate landscape area of 2,500 square feet or less may comply with the performance requirements of MWELO or conform to the prescriptive compliance measures contained in MWELO's Appendix D. [3]	N/A	
5.304.5 Graywater or rainwater use in landscape areas. For projects using treated or untreated graywater or rainwater captured on site, any lot or parcel within the project that has less than 2,500 square feet of landscape and meets the lot or parcel's landscape water requirement (Estimated Total Water Use) entirely with treated or untreated graywater or through stored rainwater captured on site is subject only to Appendix D Section (5). [3]	N/A	
DIVISION 5.4 - MATERIAL CONSERVATION AND RESOURCE EFFICIENCY		
Weather Resistance and Moisture Management		
5.407.1 Weather protection. Provide a weather-resistant exterior wall and foundation envelope as required by California Building Code, Section 1403.2 and California Energy Code, Section 150, manufacturer's installation instructions or local ordinance, whichever is more stringent.[3]	MJ	
5.407.2 Moisture control. Employ moisture control measures by the following methods;	MJ	

5.407.2.1 Sprinklers. Design and maintain landscape irrigation systems to prevent irrigation spray on structures.	N/A	
5.407.2.2 Entries and openings. Design exterior entries and openings to prevent water intrusion into buildings as follows.	MJ	
5.407.2.2.1 Exterior door protection. Primary exterior entries shall be covered to prevent water intrusion by using nonabsorbent floor and wall finishes within at least 2 feet around and perpendicular to such openings plus at least one of the following: 6. An installed awning at least 4 feet in depth. 7. The door is protected by a roof overhang at least 4 feet in depth. 8. The door is recessed at least 4 feet. 9. Other methods which provide equivalent protection.	MJ	
5.407.2.2.2 Flashing. Install flashings integrated with a drainage plane.	MJ	
Construction Waste Reduction, Disposal and Recycling		
5.408.1 Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of the non-hazardous construction waste in accordance with Section 5.408.1.1, 5.408.1.2 or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent, or	Contractor to provide, see sheet CS.3	
5.408.1.1 Construction waste management plan. Where a local jurisdiction does not have a construction and demolition waste management ordinance that is more stringent, submit a construction waste management plan that complies with Items 1 through 4 of this section.	↓	
5.408.1.2 Waste management company. Utilize a waste management company that can provide verifiable documentation that the percentage of construction waste material diverted from the landfill complies with this section. **Exceptions to Sections 5.408.1.1 and 5.408.1.2:** 1. Excavated soil and land-clearing debris 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist. 3. Demolition waste meeting local ordinance or calculated in consideration of local recycling facilities and markets	↓	
5.408.1.3 Waste stream reduction alternative. The combined weight of new construction disposal that does not exceed two pounds per square foot of building area may be deemed to meet the 65 percent minimum requirement as approved by the enforcing agency.	↓	
5.408.1.4 Documentation. Provide documentation of the waste management plan that meets the requirements listed in Sections 5.408.1.1 through 5.408.1.3, and the plan is accessible to the enforcement authority.	↓	

5.408.2 Universal Waste. [A] Additions and alterations to a building or tenant space that meet the scoping provisions in Section 301.3 for nonresidential additions and alterations, shall require verification that Universal Waste items such as fluorescent lamps and ballast and mercury containing thermostats as well as other California prohibited Universal Waste materials are disposed of properly and are diverted from landfills. A list of prohibited Universal Waste materials shall be included in the construction documents. **Note:** Refer to the Universal Waste Rule link at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/OEARA_REGS_UWR_FinalText.pdf	N/A	
5.408.3 Excavated soil and land clearing debris. 100 percent of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. **Exception:** Reuse, either on-or off-site, of vegetation or soil contaminated by disease or pest infestation.	N/A	
Building Maintenance and Operation		
5.410.1 Recycling by occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials including organic waste for recycling.[3]	N/A	
5.410.1.1 Additions. All additions conducted within a 12-month period under single or multiple permits, resulting in an increase of 30 percent or more in floor area, shall provide recycling areas on site. **Exception**: Additions within a tenant space resulting in less than a 30-percent increase in the tenant space floor area.	N/A	
5.410.2 Commissioning. [N] For new buildings 10,000 square feet and over, building commissioning for all building systems covered by Title 24, Part 6, process systems and renewable energy systems shall be included in the design and construction processes of the building project. All occupancies other than I-occupancies and L-occupancies shall comply with the California Energy Code as prescribed in California Energy Code Section 120.8. For I-occupancies which are not regulated by OSHPD or for I-occupancies and L-occupancies which are not regulated by the California Energy Code Section 100.0 Scope; all requirements in sections 5.410.2 through 5.410.2.6 shall apply. Commissioning requirements shall include items listed in Section 5.410.2. **Exceptions:** 1. Unconditioned warehouses of any size 2. Areas less than 10,000 square feet used for offices or other conditioned accessory spaces within unconditioned warehouses 3. Tenant improvements less than 10,000 square feet as described in Section 303.1.1. 4. Open parking garages of any size, or open parking garage areas of any size, within a structure.	N/A	
5.410.2.1 Owner's Project Requirements (OPR). [N] Documented before the design phase of the project begins the OPR shall include items listed in Section 5.410.2.1.	N/A	

5.410.2.2 Basis of Design (BOD). [N] A written explanation of how the design of the building systems meets the OPR shall be completed at the design phase of the building project to cover the systems listed in Section 5.410.2.2.	N/A	
5.410.2.3 Commissioning plan. [N] A commissioning plan describing how the project will be commissioned shall include items listed in Section 5.410.2.3.	↓	
5.410.2.4 [N] Functional performance testing shall demonstrate the correct installation and operation of each component, system and system-to-system interface in accordance with the approved plans and specifications.	↓	
5.410.2.5 Documentation and training. [N] A Systems manual and systems operations training are required.	↓	
5.410.2.5.1 Systems manual. [N] The systems manual shall be delivered to the building owner or representative and facilities operator and shall include the items listed in Section 5.410.2.5.1.	↓	
5.410.2.5.2 Systems operations training. [N] A program for training of the appropriate maintenance staff for each equipment type and/or system shall be developed and shall include items listed in Section 5.410.2.5.2.	↓	
5.410.2.6 Commissioning report. [N] A report of commissioning process activities undertaken through the design and construction phases of the building project shall be completed and provided to the owner or representative.	↓	
5.410.4 Testing and adjusting. Testing and adjusting of systems shall be required for buildings less than 10,000 square feet. Applies to new systems serving additions or alterations.	↓	
5.410.4.2 Systems. Develop a written plan of procedures for testing and adjusting systems. Systems to be included for testing and adjusting shall include, as applicable to the project, the systems listed in Section 5.410.4.2.	↓	
5.410.4.3 Procedures. Perform testing and adjusting procedures in accordance with applicable standards on each system as determined by the enforcing agency.	↓	
5.410.4.3.1 HVAC balancing. Before a new space-conditioning system serving a building or space is operated for normal use, balance in accordance with the procedures defined by national standards listed in Section 5.410.4.3.1 or as approved by the enforcing agency.	↓	
5.410.4.4 Reporting. After completion of testing, adjusting and balancing, provide a final report of testing signed by the individual responsible for performing these services.	↓	
5.410.4.5 Operation and maintenance manual. Provide the building owner with detailed operating and maintenance instructions and copies of guaranties/warranties for each system prior to final inspection.	↓	
5.410.4.5.1 Inspections and reports. Include a copy of all inspection verifications and reports required by the enforcing agency.	↓	
DIVISION 5.5 - ENVIRONMENTAL QUALITY		

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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2		
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2022 CALGREEN
NON-RESIDENTIAL CHECKLIST (CONTINUED)

PROJECT #: 18-10002

DRAWN: JM CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

CS.4

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwg's\Permitting\18-10002-CS.3 - CS.5.dwg modified by mjasser4 at Sep 28, 2023 - 10:58am

Fireplaces		
5.503.1 Fireplaces. Install only a direct-vent sealed-combustion gas or sealed wood-burning fireplace or a sealed woodstove and refer to residential requirements in the California Energy Code, Title 24, Part 6, Subchapter 7, Section 150.	N/A	
5.503.1.1 Woodstoves. Woodstoves shall comply with US EPA New Source Performance Standards (NSPS) emission limits, where applicable, and shall have a permanent label indicating they are certified to meet the emission limits.	N/A	
Pollutant Control		
5.504.1 Temporary ventilation. If the HVAC system is used during construction, use return air filters with a MERV of 8, based on ASHRAE 52.2-1999, or an average efficiency of 30% based on ASHRAE 52.1-1992. Replace all filters immediately prior to occupancy. Applies to additions or alterations.	N/A	
5.504.3 Covering of duct openings and protection of mechanical equipment during construction. At the time of rough installation and during storage on the construction site and until final startup of the heating, cooling and ventilating equipment, all duct and other related air distribution component openings shall be covered with tape, plastic, sheetmetal or other methods acceptable to the enforcing agency to reduce the amount of dust, water and debris which may enter the system.	N/A	
5.504.4 Finish material pollutant control. Finish materials shall comply with Sections 5.504.4.1 through 5.504.4.6.		
5.504.4.1 Adhesives, sealants, caulks. Adhesives and sealants used on the project shall meet the requirements of the following standards. 1. Adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers and caulks shall comply with local or regional air pollution control or air quality management district rules where applicable or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2. 2. Aerosol adhesives and smaller unit sizes of adhesives and sealant or caulking compounds (in units of product, less packaging, which do not weigh more than one pound and do not consist of more than 16 fluid ounces) shall comply with statewide VOC standards and other requirements, including prohibitions on use of certain toxic compounds, of California Code of Regulations, Title 17, commencing with Section 94507.	MJ	
5.504.4.3 Paints and coatings. Architectural paints and coatings shall comply with Table 5.504.4.3 unless more stringent local limits apply.	MJ	
5.504.4.3.1 Aerosol paints and coatings. Aerosol paints and coatings shall meet the Product- Weighted MIR Limits for ROC in Section 94522(a)(3) and other requirements, including prohibitions on use of certain toxic compounds and ozone depleting substances (CCR, Title 17, Section 94520, et seq.).	MJ	
5.504.4.3.2 Verification. Verification of compliance with this section shall be provided at the request of the enforcing agency.	MJ	
5.504.4.4 Carpet systems. All carpet installed in the building interior shall meet the testing and product requirements of one of the standards listed in Section 5.504.4.4.	N/A	

5.504.4.4.1 Carpet cushion. All carpet cushion installed in the building interior shall meet the requirements of the Carpet and Rug Institute's Green Label program.	N/A	
5.504.4.4.2 Carpet adhesive. All carpet adhesive shall meet the requirements of Table 5.504.4.1.	N/A	
5.504.4.5 Composite wood products. Hardwood plywood, particleboard and medium density fiberboard composite wood products used on the interior or exterior of the building shall meet the requirements for formaldehyde as specified in Table 5.504.4.5.	MJ	
5.504.4.5.3 Documentation. Verification of compliance with this section shall be provided as requested by the enforcing agency. Documentation shall include at least one of the following: 1. Product certifications and specifications. 2. Chain of custody certifications. 3. Product labeled and invoiced as meeting the Composite Wood Products regulation (see CCR, Title 17, Section 93120, et seq.). 4. Exterior grade products marked as meeting the PS-1 or PS-2 standards of the Engineered Wood Association, the Australian AS/NZS 2269 or European 636 3S standards. 5. Other methods acceptable to the enforcing agency.	MJ	
5.504.4.6 Resilient flooring systems. For 80 percent of floor area receiving resilient flooring, install resilient flooring which meets one of the following: 1. Certified under the Resilient Floor Covering Institute (RFCI) FloorScore program; 2. Compliant with the VOC-emission limits and testing requirements specified in the California Department of Public Health's 2010 Standard Method for the Testing and Evaluation Chambers, Version 1.1, February 2010; 3. Compliant with the Collaborative for High Performance Schools California (CA-CHPS) Criteria Interpretation for EQ 7.0 and 7.1 (formerly EQ. 2.2) dated July 2012 and listed in the CHPS High Performance Product Database; or 4. Products certified under UL GREENGUARD Gold (formerly the Greenguard Children's & Schools Program).	N/A	
5.504.5.3 Filters. In mechanically ventilated buildings, provide regularly occupied areas of the building with air filtration media for outside and return air that provides at least a MERV of 13. MERV 13 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual.	N/A	
5.504.7 Environmental tobacco smoke (ETS) control. Prohibit smoking within 25 feet of building entries, outdoor air intakes and operable windows where outdoor areas are provided for smoking and within the building as already prohibited by other laws or regulations; or as enforced by ordinances, regulations or policies of any city, county, city and county, California Community College, campus of the California State University or campus of the University of California, whichever are more stringent.	MJ	
Indoor Moisture and Radon Control		
5.505.1 Indoor moisture control. Buildings shall meet or exceed the provisions of California Building Code, CCR, Title 24, Part 2, Sections 1203 and Chapter 14.1. [3]	MJ	

Air Quality and Exhaust		
5.506.1 Outside air delivery. For mechanically or naturally ventilated spaces in buildings, meet the minimum requirements of Section 120.1 of the California Energy Code and Chapter 4 of CCR, Title 8 or the applicable local code, whichever is more stringent. [3]	N/A	
5.506.2 Carbon dioxide (CO2) monitoring. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the California Energy Code, CCR, Section 120(c)(4).[3]	N/A	
Environmental Comfort		
5.507.4 Acoustical control. Employ building assemblies and components with STC values determined in accordance with ASTM E90 and ASTM E413 or OITC determined in accordance with ASTM E1332, using either the prescriptive or performance method in Section 5.507.4.1 or 5.507.4.2.	N/A	
5.507.4.1 Exterior noise transmission, prescriptive method. Wall and floor-ceiling assemblies exposed to the noise source making up the building envelope shall have exterior wall and roof ceiling assemblies meeting a composite STC rating of at least 50 or a composite OITC rating of no less than 40 with exterior windows of a minimum STC of 40 or OITC of 30 in the locations described in Items 1 and 2. Also applies to addition envelope or altered envelope.		
5.507.4.1.1 Noise exposure where noise contours are not readily available. Buildings exposed to a noise level of 65 dB Leq-1Hr during any hour of operation shall have exterior wall and roof-ceiling assemblies exposed to the noise source meeting a composite STC rating of at least 45 (or OITC 35), with exterior windows of a minimum STC of 40 (or OITC 30). Also applies to addition or alteration exterior wall. OR		
5.507.4.2 Performance method. For buildings located as defined in Sections A5.507.4.1 or A5.507.4.1.1, wall and roof-ceiling assemblies making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level (Leq-1Hr) of 50 dBA in occupied areas during any hour of operation. Also applies to addition envelope or altered envelope.		
5.507.4.2.1 Site features. Exterior features such as sound walls or earth berms may be utilized as appropriate to the project to mitigate sound migration to the interior. Also applies to addition envelope or altered envelope.		
5.507.4.2.2 Documentation of compliance. An acoustical analysis documenting complying interior sound levels shall be prepared by personnel approved by the architect or engineer of record.		
5.507.4.3 Interior sound transmission. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have an STC of at least 40.		
Outdoor Air Quality		

5.508.1 Ozone depletion and global warming reductions. Installations of HVAC, refrigeration and fire suppression equipment shall comply with Sections 5.508.1.1 and 5.508.1.2.	N/A	
5.508.1.1 CFCs. Install HVAC and refrigeration equipment that does not contain CFCs. [3]	N/A	
5.508.1.2 Halons. Install fire suppression equipment that does not contain Halons.[1]	MJ	
5.508.2 Supermarket refrigerant leak reduction. New commercial refrigeration systems shall comply with the provisions of this section when installed in retail food stores 8,000 square feet or more conditioned area, and that utilize either refrigerated display cases, or walk-in coolers or freezers connected to remote compressor units or condensing units. The leak reduction measures apply to refrigeration systems containing high-global- warming potential (high-GWP) refrigerants with a GWP of 150 or greater. New refrigeration systems include both new facilities and the replacement of existing refrigeration systems in existing facilities. **Exception:** Refrigeration systems containing low-global warming potential (low-GWP) refrigerant with a GWP value less than 150 are not subject to this section. Low-GWP refrigerants are non-ozone-depleting refrigerants that include ammonia, carbon dioxide (CO_2), and potentially other refrigerants.	N/A	

1. Green building measures in this table may be mandatory if adopted by a city, county, or city and county as specified in Section 101.7.
3. These measures are currently required elsewhere in statute or in regulation.

CALGREEN SIGNATURE DECLARATIONS

Project Name: - PROPOSED RETAIL BUILDING
Project Address: - 2219 EL CAMINO REAL
Project Description: - CONTRUCT 2,630 RETAIL BUILDING (UN-OCCUPIED)

SECTION 1 - DESIGN VERIFICATION

Complete all lines of Section 1 - "Design Verification" and submit the completed checklist (Columns 1 and 2) with the plans and building permit application to the Building Department.

The owner and design professional responsible for compliance with CalGreen Standards have revised the plans and certify that the items checked above are hereby incorporated into the project plans and will be implemented into the project in accordance with the requirements set forth in the 2016 California Green Building Standards Code as adopted by the City.

Owner's Signature — Date
VARUN ENETERPRISE, INC. / MR. BALDEV MANN

Owner's Name (Please Print)

Design Professional's Signature — Date
M I ARCHITECTS, INC. / MR. MUTHANA IBRAHIM — 09-26-23

Design Professional's Name (Please Print)
MUTHANA IBRAHIM

Signature of License Professional responsible for CalGreen compliance — Date
09/27/23

Name of License Professional responsible for CalGreen compliance (Please Print) — Phone
Michael P. McDermott (916) 933-5791

Email Address for License Professional responsible for CalGreen compliance mikem@themcdermottgroup.com

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Muthana Ibrahim
Architect
President

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RE: Proposed Retail Building (Un-Occupied)
2219 El Camino Real
Redwood City, CA 94063

2022 CALGREEN NON-RESIDENTIAL CHECKLIST:

DIVISION 5.4: MATERIAL CONSERVATION AND RESOURCE EFFICIENCY
Weather Protection (5.407.1):
Walls provided with weather resistive barrier. Roof provided with fully adhered single-ply roofing system. Comply with 2022 CBC Sec. 1403.2 and Sec. 1507.
Moisture Control (5.407.2):
Sprinklers (5.407.2.1):
The existing planting areas being modified for the scope of work of this project are already provided with a subsurface dripline irrigation system. The existing system will be modified to accommodate new work.
Exterior Door Protection (5.407.2.2.1) & Flashing (5.407.2.2.2):
Flashings have been provided above exterior door headers and storefront headers, see detail 11 & 14 on sheet A5.1. The entry door is provided with an awning which extends 4'-0" from the face of the exterior wall, see sheet A1.5 & detail 9 & 10 on sheet A5.3.
Construction Waste Reduction, Disposal and Recycling
Construction Waste Management (5.408.1):
To be provided by the general contractor. Contractor to be determined.
Excavated soil and land clearing debris (5.408.3):
To be provided by the general contractor. Contractor to be determined.

DIVISION 5.5: ENVIRONMENTAL QUALITY
Finish Material Pollutant Control (5.504.4)
1. Adhesive, Sealant and caulks shall be compliant with VOC and other toxic compounds limits. See technical specifications Section 079200, Part 2.1B.
2. Paints, Stains and other coatings shall be compliant with VOC limits. See technical specifications Section 099113, Part 2.2B.
3. Documentation to be provided by the contractor (if required)

Please give us a call if you have any questions or need additional materials.
I can be reached at (925) 287-1174 x1

Sincerely,

Muthana Ibrahim

Architect, President
M I Architects, Inc.

M I Architects
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925-878-9875 Cell
muthana@miarchitect.com
www.miarchitect.com

NOT FOR CONSTRUCTION

PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

DRAWINGS AND SPECIFICATIONS AND THE CONCEPTS EMBODIED WITHIN THEM CONSTITUTE THE ORIGINAL UNPUBLISHED WORK OF M I ARCHITECTS, INC. AND ARE NOT TO BE USED IN WHOLE OR IN PART FOR ANY PURPOSE OTHER THAN THE SPECIFIC PROJECT FOR WHICH THEY WERE PREPARED AND DEVELOPED. THE USE, DUPLICATION OR DISCLOSURE OF THE DOCUMENTS WITHOUT EXPRESSED WRITTEN CONSENT FROM M I ARCHITECTS, INC. IS PROHIBITED.

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

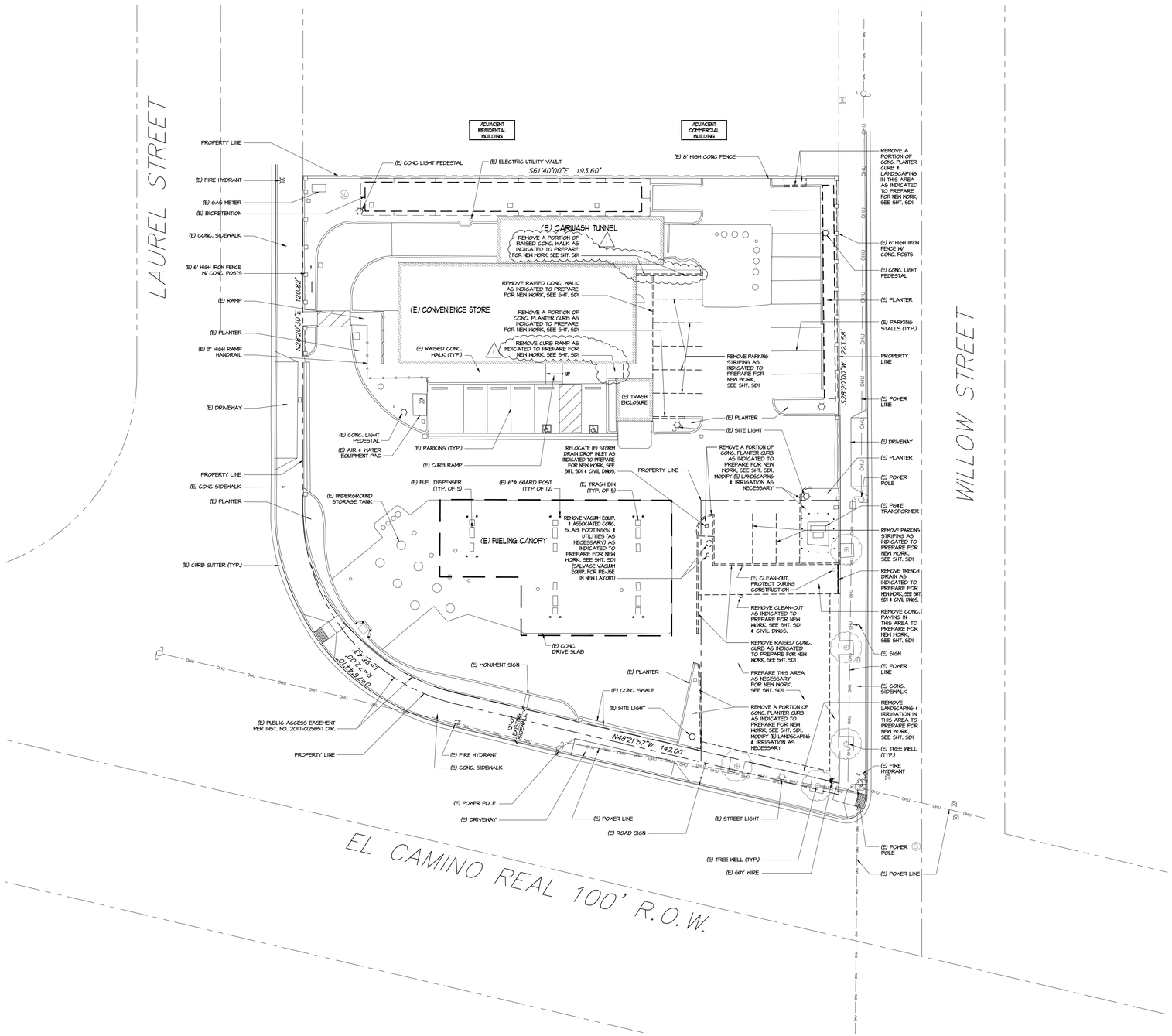
2022 CALGREEN NON-RESIDENTIAL CHECKLIST (CONTINUED)

PROJECT #: 18-10002
DRAWN: JM CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

CS.5

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwg's\Permitting\18-10002-CS.3 - CS.5.dwg modified by mmusent at Sep 28, 2023 - 10:59am



1 DEMOLITION SITE PLAN

1" = 20'-0"

GRAPHIC SCALE: 1" = 20'-0"

20 0 10 20 40 FEET

NORTH

NOTES

1. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING PLUMBING AND ELECTRICAL EQUIPMENT TO REMAIN, TO BE CAPPED & ABANDONED OR REMOVED.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONITORING WELLS, SURVEY MONUMENTS & OTHER SURVEY MARKERS DURING CONSTRUCTION TO REMAIN SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. SHOULD SAID ITEMS BE DAMAGED AND/OR DESTROYED DURING CONSTRUCTION, THEY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. RESET EXISTING MONITORING WELLS TO REMAIN AS NECESSARY WHERE THERE IS NEW CONSTRUCTION. CONTRACTOR SHALL OBTAIN THE REQUIRED PERMITS FROM THE PROPER JURISDICTION & NOTIFY THE OWNERS ENVIRONMENTAL CONSULTANT FOR ANY WORK CONCERNING THE MONITORING WELLS, PRIOR TO COMMENCEMENT OF ANY WORK.
3. CONTRACTOR IS TO NOTIFY PROJECT ARCHITECT IF SITE CONDITIONS DISAGREE WITH INFORMATION SHOWN ON DRAWINGS.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF THE LOCATION OF ALL EXISTING UTILITIES WHICH ARE IN OPERATION AND SHALL PROTECT THEM FROM DAMAGE IN THE FIELD. THE CONTRACTOR SHALL CALL USA TOLL FREE AT (811). LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL BEAR ALL OF THE REPAIR AND/OR REPLACEMENT COSTS OF SAID UTILITIES DAMAGED BY CONTRACTOR(S) DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT.
5. THE INFORMATION REGARDING THIS SITE PLAN WAS OBTAINED FROM A TOPOGRAPHIC & BOUNDARY SURVEY PREPARED BY TRIAD / HOLMES ASSOC. THE CONTRACTOR SHALL VERIFY THE EXISTING SITE CONDITIONS, AND IN THE EVENT THAT A CONFLICT OCCURS THE CONTRACTOR SHALL NOTIFY THE PROJECT ARCHITECT BEFORE PROCEEDING WITH ANY WORK. M I ARCHITECTS, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE SITE PLAN OR PROPERTY LINE INFORMATION.
6. AFTER REMOVAL OF CONC./ASPHALT PAVING, CONC. PLANTER CURBS, LANDSCAPING, UNDERGROUND UTILITIES, ETC., TO ACCOMMODATE NEW WORK, RE-COMPACT SUB-GRADE AS REQUIRED BY THE SOILS ENGINEER.
7. CONTRACTOR SHALL OBTAIN THE NECESSARY PERMITS (IF REQUIRED), AS APPLICABLE FOR THE REMOVAL OF THE WASTE OIL TANK, SERVICE BAY HOISTS & ANY OTHER EQUIPMENT AS NECESSARY TO ACCOMMODATE NEW CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE W/ THE UTILITY COMPANIES, (PG&E FOR THE SHUT DOWN OF THE POWER & REMOVAL OF THE (E) SERVICES (IF APPLICABLE)).

SITE PLAN LEGEND

- EXISTING CURB TO REMAIN
- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- EXISTING CURB TO BE REMOVED

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PROPOSED RETAIL BUILDING
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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
04-21-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
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3		
4		
5		

DEMOLITION SITE PLAN

PROJECT #: 18-10002

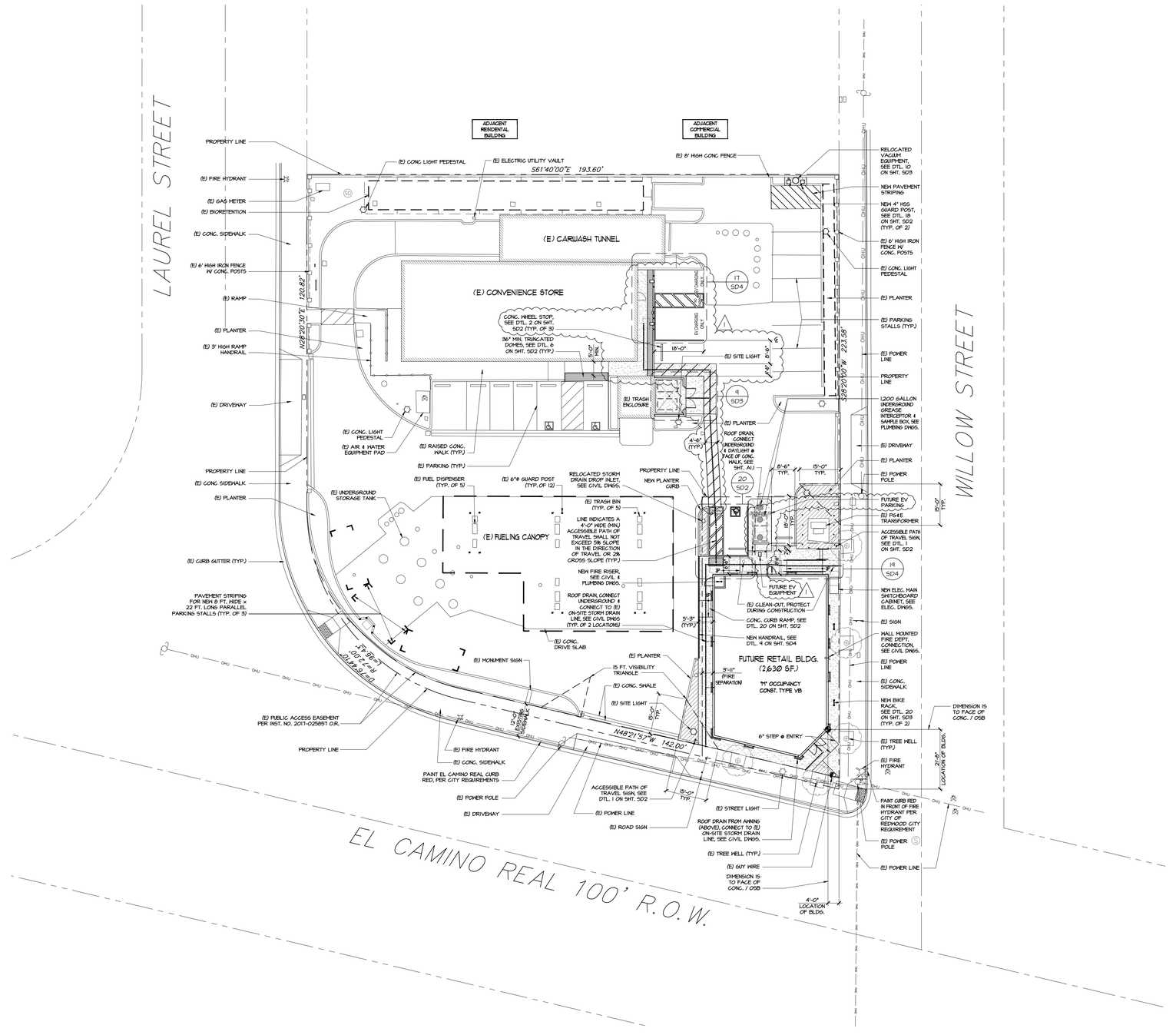
DRAWN: JM CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

SDO

SHEET OF

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1 SITE PLAN
1" = 20'-0"

20 0 10 20 40 FEET
GRAPHIC SCALE: 1" = 20'-0"

NORTH

NOTES

1. CONTRACTOR IS TO NOTIFY PROJECT ARCHITECT IF SITE CONDITIONS DISAGREE WITH INFORMATION SHOWN ON DRAWINGS.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF THE LOCATION OF ALL EXISTING UTILITIES WHICH ARE IN OPERATION AND SHALL PROTECT THEM FROM DAMAGE IN THE FIELD. THE CONTRACTOR SHALL CALL USA TOLL FREE AT 800-227-2600. LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND FOR GENERAL INFORMATION ONLY. THE CONTRACTOR SHALL BEAR ALL OF THE REPAIR AND/OR REPLACEMENT COSTS OF SAID UTILITIES DAMAGED BY CONTRACTOR(S) DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT.
5. THE INFORMATION REGARDING THIS SITE PLAN WAS OBTAINED FROM A TOPOGRAPHIC & BOUNDARY SURVEY PREPARED BY TRIAD / HOLMES ASSOC. THE CONTRACTOR SHALL VERIFY THE EXISTING SITE CONDITIONS, AND IN THE EVENT THAT A CONFLICT OCCURS THE CONTRACTOR SHALL NOTIFY THE PROJECT ARCHITECT BEFORE PROCEEDING WITH ANY WORK. M I ARCHITECTS, INC. ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE SITE PLAN OR PROPERTY LINE INFORMATION.
6. THESE PLANS ARE INTENDED TO COMPLY WITH THE CBC, 2022 EDITION.
7. CONSTRUCTION MATERIALS, ASSEMBLIES AND PROCEDURES ARE TO FOLLOW LOCALLY ADOPTED BUILDING CODES AND SUPPLEMENTAL ORDINANCES. WHEN A CONFLICT OCCURS BETWEEN SUCH LOCAL CODE AND INFORMATION SHOWN ON THE PLANS, CONSULT THE PROJECT ARCHITECT FOR RESOLUTION PRIOR TO COMMENCING WORK.
8. SEPARATE CONTRACTS FOR SUCH WORK AS PAVING, LANDSCAPING AND SIGN INSTALLATION MAY BE AWARDED BY THE CLIENT. IN ADDITION CERTAIN SPECIALTY ITEMS SUCH AS LIGHTING FIXTURES, DISPENSERS, ETC. MAY BE PURCHASED DIRECTLY BY THE CLIENT FOR DELIVERY TO THE GENERAL CONTRACTOR, WHO WILL BE RESPONSIBLE FOR THEIR INSTALLATION. COORDINATE SCOPE OF WORK W/ OWNER. THE GENERAL CONTRACTOR SHALL COOPERATE WITH AND COORDINATE THE WORK OF SEPARATE CONTRACTORS.
9. ALL NEW CONCRETE PAVING WORK SHALL MATCH EXISTING GRADES AT LIMITS OF WORK.
10. IF REQUIRED BY THE CITY OF SACRAMENTO , THE GENERAL CONTRACTOR SHALL APPLY FOR AND OBTAIN AN ENCROACHMENT PERMIT FOR ANY OFF-SITE IMPROVEMENT WORK.
11. FOR CONCRETE REQUIREMENTS: ALL EXTERIOR CONCRETE SHALL BE 6" MINIMUM THICKNESS FIBER REINFORCED, U.O.N. NEW CONCRETE PAVING TO BE SEALED ENTIRELY WITH C&L COATING MB-20 AQUA-CRETE. SEAL ALL CONCRETE JOINTS AS APPROVED BY OWNER.
12. WALKS AND SIDEWALKS SHALL HAVE A CONTINUOUS COMMON SURFACE, NOT INTERRUPTED BY STEPS OR BY ABRUPT CHANGES IN LEVEL EXCEEDING 1/4 INCH, AND SHALL BE A MINIMUM OF 48 INCHES IN WIDTH.
13. ACCESSIBLE WALK SURFACE CROSS SLOPES SHALL NOT EXCEED 1/4 INCH PER FOOT (2% MAX.).
14. WALKS, SIDEWALKS AND PEDESTRIAN WAYS SHALL BE FREE OF GRATINGS WHENEVER POSSIBLE. FOR GRATINGS LOCATED IN THE SURFACE OF ANY OF THESE AREAS, GRID OPENING IN GRATINGS SHALL BE LIMITED TO 1/2 INCH IN THE DIRECTION OF TRAFFIC FLOW.
15. ABRUPT CHANGES IN LEVEL ALONG ANY ACCESSIBLE ROUTE SHALL NOT EXCEED 1/2 INCH. WHEN CHANGES IN LEVEL DO OCCUR, THEY SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 1 : 2 EXCEPT THAT LEVEL CHANGES NOT EXCEEDING 1/4 INCH MAY BE VERTICAL.
16. FLOOR AND GROUND SURFACES SHALL BE STABLE, FIRM AND SLIP RESISTANT AND SHALL COMPLY WITH CBC 2022 SEC. 11B-302.
17. ACCESSIBLE ROUTE OF TRAVEL FROM PUBLIC RIGHT-OF-WAY & ACCESSIBLE PARKING STALL TO ACCESSIBLE BUILDING ENTRANCE SHALL NOT EXCEED 5% SLOPE IN THE DIRECTION OF TRAVEL & 2% CROSS SLOPE & NO SUDDEN CHANGE IN SURFACE ELEVATION GREATER THAN ¼ INCH MAX. CONTRACTOR SHALL REPLACE PAVEMENT ANYWHERE ALONG THE PATH OF TRAVEL IF DOES NOT MEET THESE REQUIREMENTS. ALSO SEE NOTE #14.
18. ACCESSIBLE PARKING STALL & ACCESS AISLE AT PASSENGER LOADING ZONE SHALL BE LEVEL WITH A SURFACE SLOPE NOT EXCEEDING (2%) SLOPE IN ANY DIRECTION. CONTRACTOR TO SAW-CUT & REPLACE EXISTING PAVEMENT TO MEET THESE REQUIREMENTS (AS NEEDED TO ACCOMMODATE NEW CONSTRUCTION). CONTRACTOR SHALL ENSURE PROPER SURFACE DRAINAGE AS NEEDED. WATER PONDING IS NOT ACCEPTABLE.

FIRE DEPARTMENT NOTES

1. EMERGENCY RESPONDER RADIO COVERAGE SYSTEM WILL BE A DEFERRED SUBMITTAL.
2. FIRE DEPARTMENT KNOX BUILDING ACCESS WILL BE PROVIDED WITH THE BUILDING PERMIT DRAWINGS.
3. AUTOMATIC FIRE SPRINKLER SYSTEM WILL BE A DEFERRED SUBMITTAL.
4. FIRE ALARM SYSTEM WILL BE A DEFERRED SUBMITTAL.
5. PREMISSES IDENTIFICATION (ADDRESS NUMBERS) WILL BE PROVIDED WITH THE BUILDING PERMIT DRAWINGS.
6. PORTABLE FIRE EXTINGUISHER WILL BE INCLUDED WITH THE BUILDING PERMIT DRAWING.

PARKING REQUIREMENTS

TOTAL PARKING SPACES PROVIDED (NOT INCLUDING EVCS):	21 SPACES
AIR / WATER & VACUUM (SERVICE SPACES):	2 SPACES
EV CHARGING ONLY SPACES:	2 SPACES
TOTAL ACCESSIBLE PARKING REQUIRED: (PER TABLE 11B-208.2)	1 SPACE
VAN ACCESSIBLE PARKING PROVIDED:	1 SPACE
ACCESSIBLE PARKING PROVIDED:	2 SPACES

SITE PLAN LEGEND

NEW AND/OR EXISTING LANDSCAPING, NEW PLANTS SHALL MATCH (E). EXTEND (E) IRRIGATION TO NEW LANDSCAPE AREAS AS NECESSARY

NEW CONCRETE PAVING AND/OR CONC. WALK, SEE DTL. 4, 5 & 10 ON SHT. SD2 & CIVIL DWGS.

4 FT. WIDE (MIN.) ACCESSIBLE ROUTE OF TRAVEL, SHALL NOT EXCEED 5% SLOPE IN THE DIRECTION OF TRAVEL AND 2% CROSS SLOPE

CONCRETE PLANTER CURB, SEE DTL. 3 ON SHT. SD2

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NOT FOR CONSTRUCTION

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PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION
-		ISSUED FOR CONSTRUCTION
04-24-23		ISSUED FOR PLAN CHECK
10-21-14		ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS

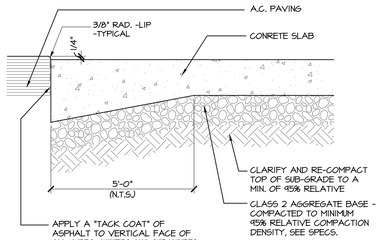
SITE PLAN

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

SD1

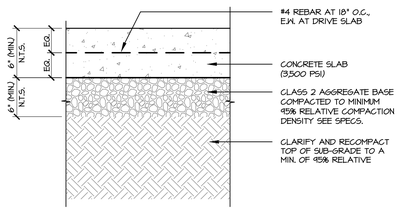
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S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwg's\Permitting\18-10002-SD1.dwg modified by Muthana Ibrahim at Dec 27, 2023 - 11:41am



5
1 1/2"=1'-0"

CONCRETE SLAB

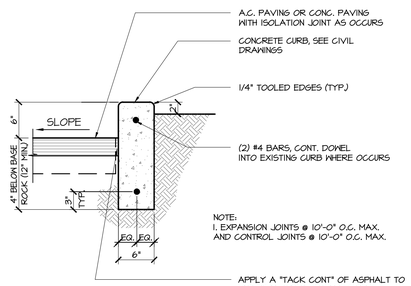


NOTE:

PAVEMENT SECTION BASED ON GEOTECHNICAL ENGINEERING INVESTIGATION PREPARED BY MATRISCOPE ENGINEERING LABORATORIES, INC., PROJECT NO. 2567, DATED JANUARY 8, 2016 & GEOTECHNICAL REPORT UPDATE LETTER DATED AUGUST 1, 2023. SAID REPORT & UPDATE LETTER SHALL BE CONSIDERED A PART OF THESE PLANS.

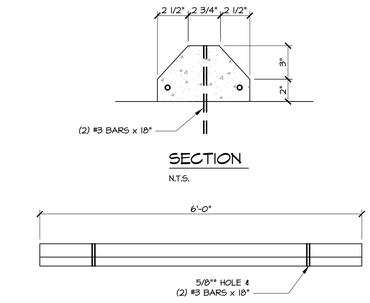
4
N.T.S.

CONCRETE PAVING



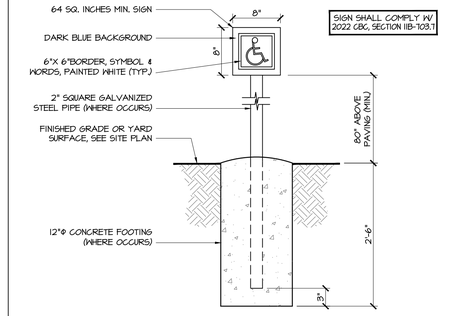
3
1" = 1'-0"

PLANTER CURB



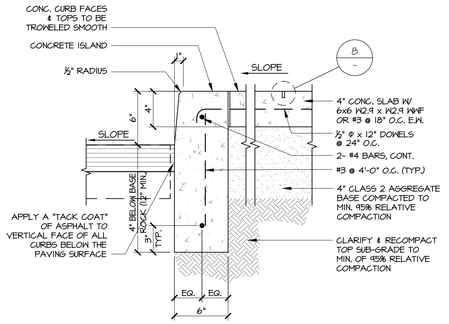
2
3/4" = 1'-0"

CONCRETE WHEEL STOP



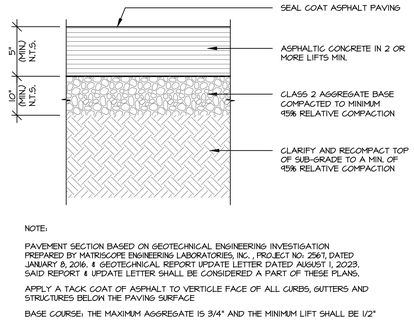
1
1"=1'-0"

INTERNATIONAL SYMBOL



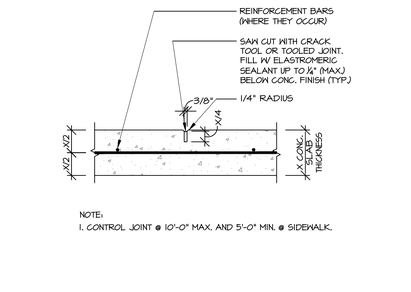
10
1 1/2"=1'-0"

CONCRETE WALK



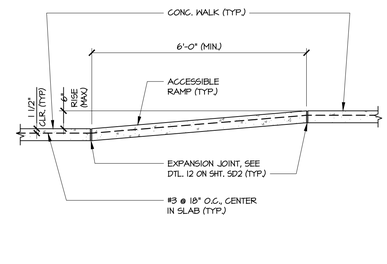
9
N.T.S.

FLEXIBLE PAVING



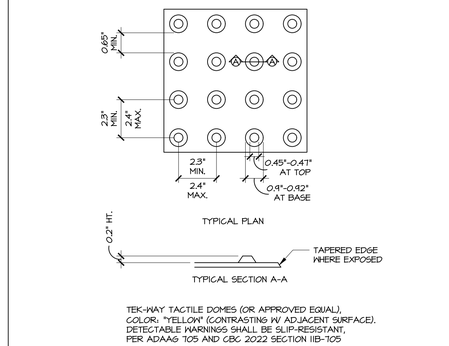
8
1 1/2"=1'-0"

CONTROL JOINT DETAIL



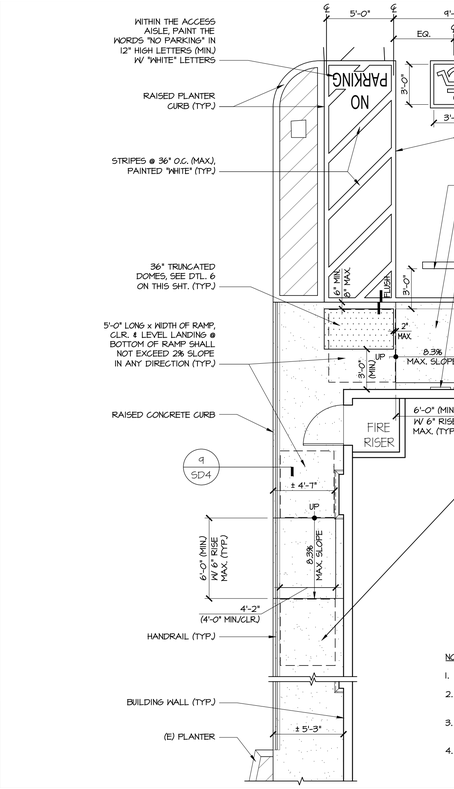
7
1/2" = 1'-0"

ACCESSIBLE CURB RAMP SECTION



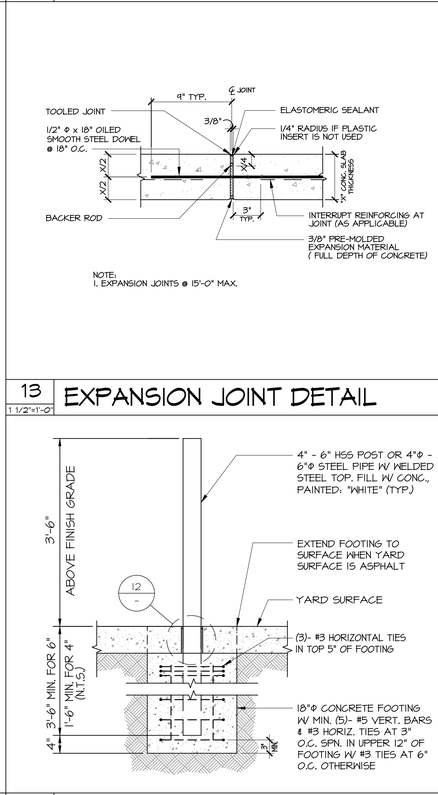
6
N.T.S.

TRUNCATED DOMES



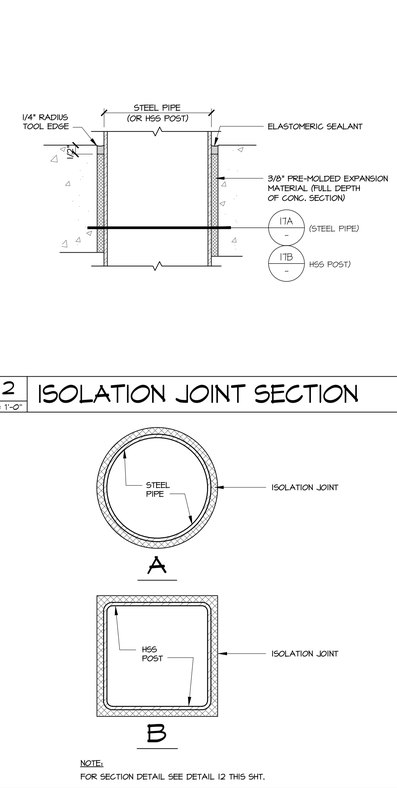
20
3/16" = 1'-0"

ACCESSIBLE PARKING STALL PLAN



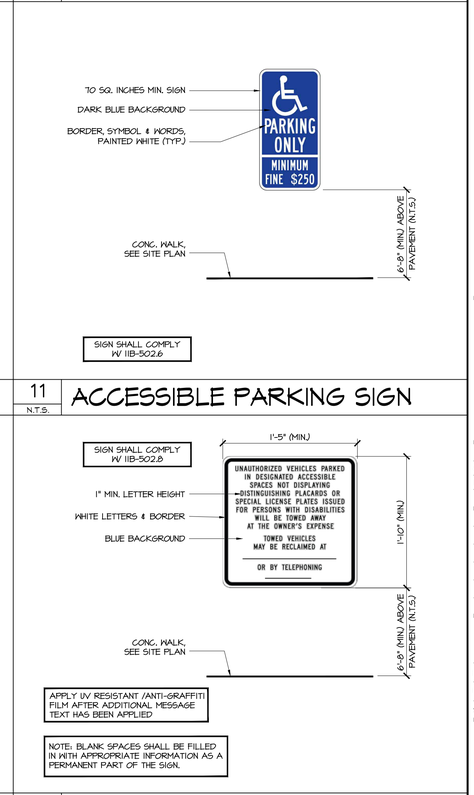
18
3/4" = 1'-0"

GUARD POST



17
3/8" = 1'-0"

AREA LIGHT



16
1" = 1'-0"

ACCESSIBLE PARKING WARNING SIGN

13
1 1/2"=1'-0"

EXPANSION JOINT DETAIL

12
3" = 1'-0"

ISOLATION JOINT SECTION

11
N.T.S.

ACCESSIBLE PARKING SIGN

M I Architects, Inc.
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www.mlarchitect.com

NOT FOR CONSTRUCTION

PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
04-24-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS

SITE DETAILS

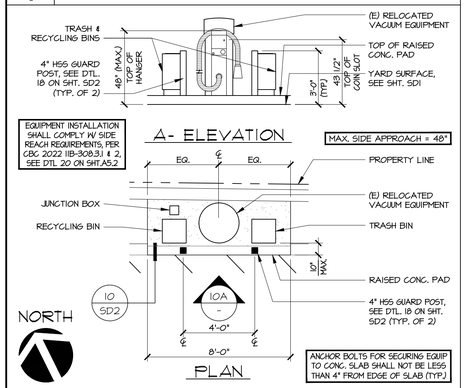
PROJECT #: 18-10002
DRAWN: JM CHECKED: MII
SCALE: AS NOTED DATE: 11-14-23

SD2

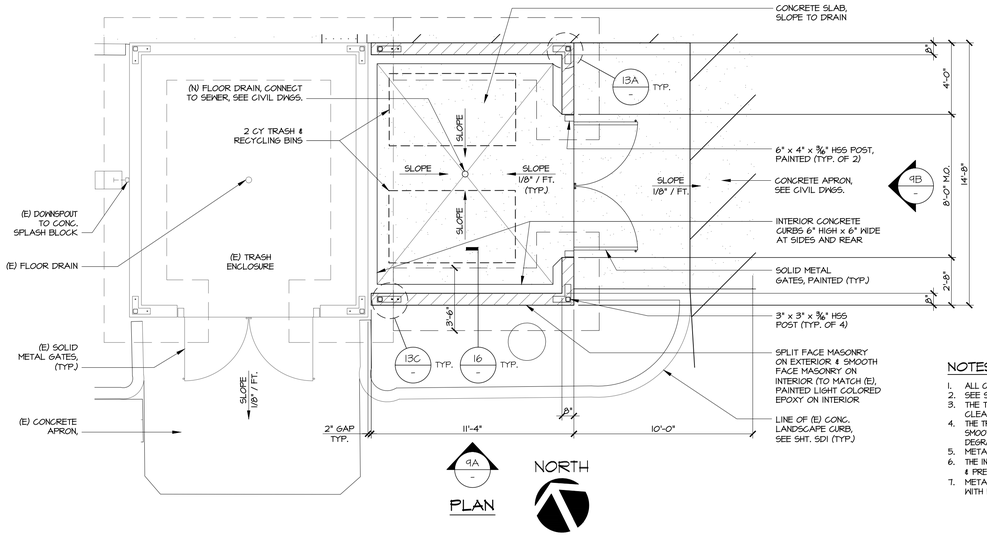
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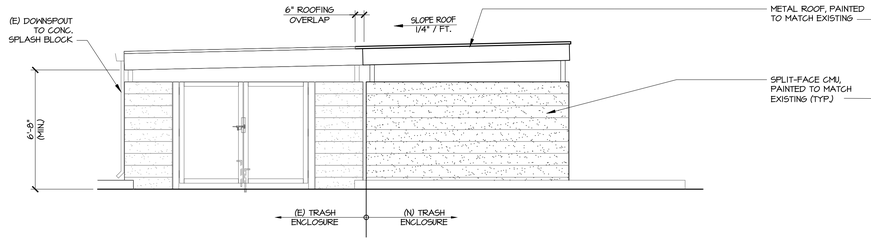
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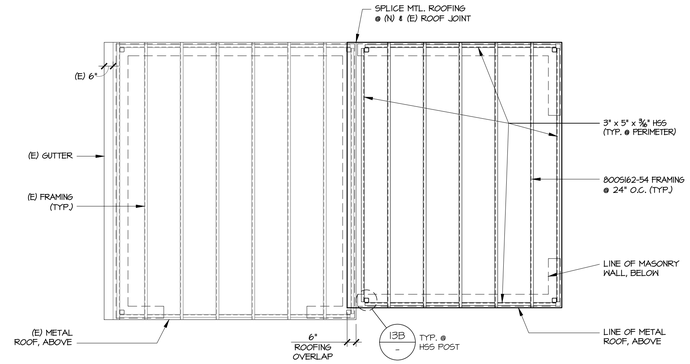
5 NOT USED



10 VACUUM EQUIPMENT
1/4" = 1'-0"



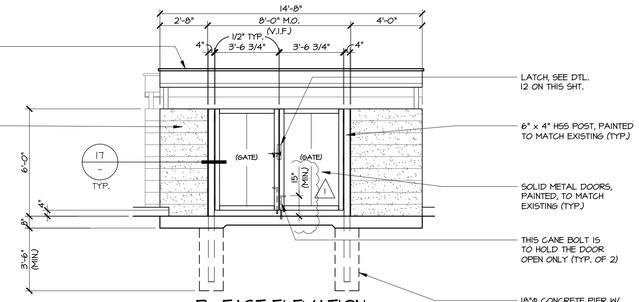




NOTES

1. ALL CONC. BLOCK MORTAR JOINTS SHALL BE FLUSH & SMOOTH AT INSIDE FACE.
2. SEE SITE PLAN FOR LOCATION OF TRASH ENCLOSURE.
3. THE TRASH ENCLOSURE PAD SHALL BE SEALED WITH A "NON-PIGMENTED" CLEAR CONCRETE SEALER.
4. THE TRASH ENCLOSURE WALLS & FLOOR SHALL HAVE FINISHES THAT ARE SMOOTH, NON-ABSORBENT, DURABLE, EASILY CLEANABLE AND RESISTANT TO DEGRADATION BY MOISTURE AND CLEANING COMPOUNDS.
5. METAL DECK SHALL BE HR-36, MANUF. BY AEP SPAN.
6. THE INTERIOR OF THE TRASH ENCLOSURE SHALL BE CLEANED (DAILY) OF DEBRIS & PRESSURE WASHED (MONTHLY).
7. METAL GATES (DOORS) OF THE TRASH ENCLOSURE SHALL BE COATED WITH RUST-INHIBITIVE PAINT.

ROOF FRAMING PLAN

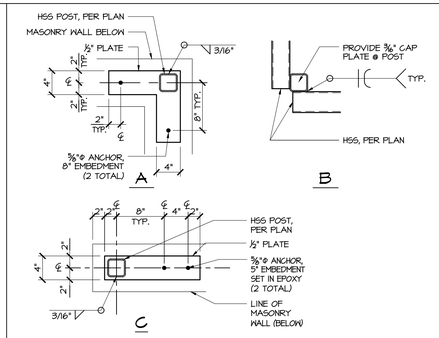


9 TRASH ENCLOSURE PLAN & ELEVATIONS
1/4" = 1'-0"

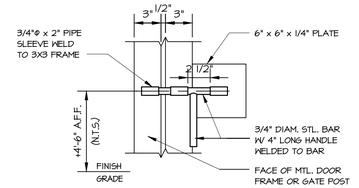
15 NOT USED

14 NOT USED

13 TRASH ENCLOSURE FRAMING
1" = 1'-0"



12 GATE LATCH
1 1/2"=1'-0"



11 NOT USED

10 NOT USED

9 NOT USED

8 NOT USED

7 NOT USED

6 NOT USED

5 NOT USED

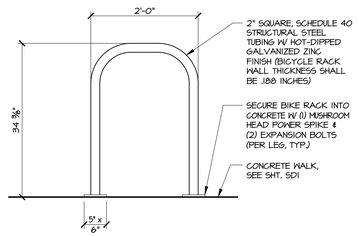
4 NOT USED

3 NOT USED

2 NOT USED

1 NOT USED

20 BIKE RACK
3/4" = 1'-0"

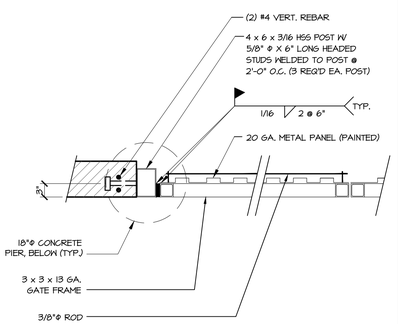


NOTE: BICYCLE RACK ANCHORS SHALL MATCH FINISH OF BIKE RACK (TYP.)

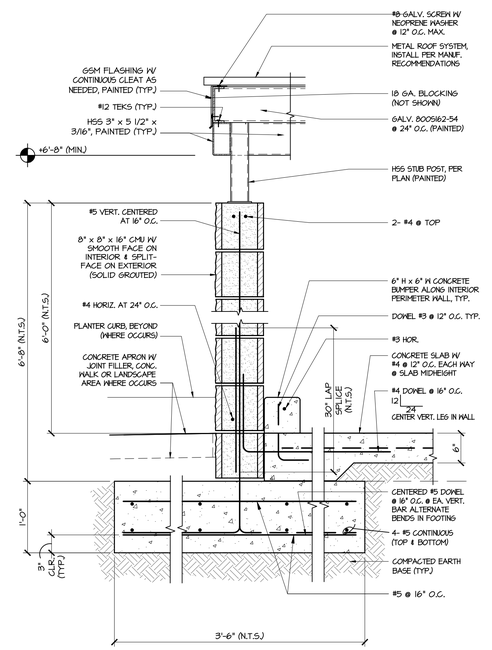
19 NOT USED

18 NOT USED

17 GATE @ SIDE WALL
3/4" = 1'-0"



16 TRASH ENCLOSURE WALL SECTION
1" = 1'-0"



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PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
04-24-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
2		
3		
4		
5		

SITE DETAILS

PROJECT #: 18-10002

DRAWN: DP CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

SD3

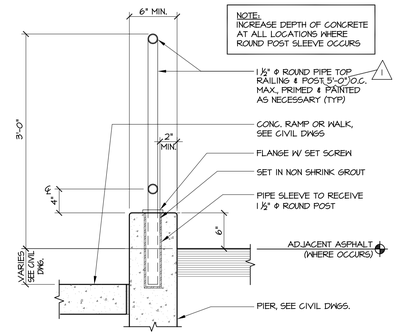
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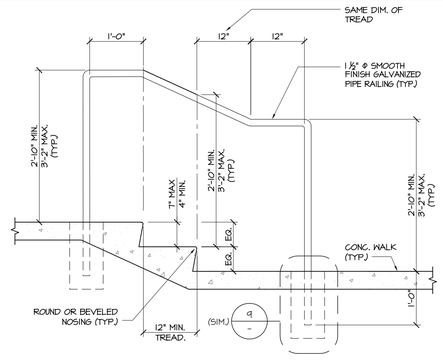
S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwg's\Permitting\18-10002-SD3.dwg modified by Muthana Ibrahim at Dec 27, 2023 - 11:47am

5 - NOT USED

4 - NOT USED

3 - NOT USED

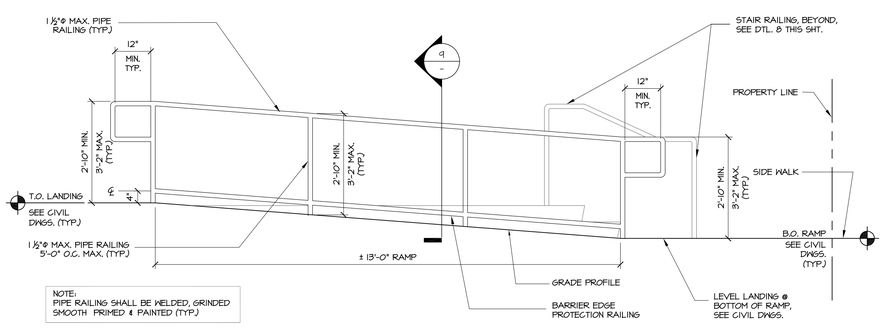




10 - NOT USED

9 - HANDRAIL

1" = 1'-0"

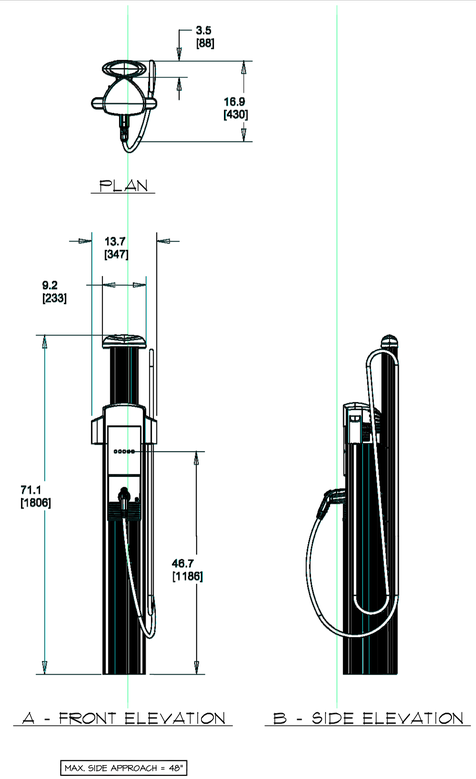


8 - STAIR SECTION

3/4" = 1'-0"

7 - EV CHARGING EQUIPMENT PLAN & ELEVATION(S) (FOR FUTURE USE)

NONE



NOTES:

1. EQUIPMENT INSTALLATION SHALL COMPLY W/ SIDE REACH REQUIREMENTS, PER CBC 2022 11B-308.3.1 & 2, SEE DTL. 20 ON SHT. A5.3, AND OPERABLE PARTS REQUIREMENT, PER CBC 2022 11B-811.10.2

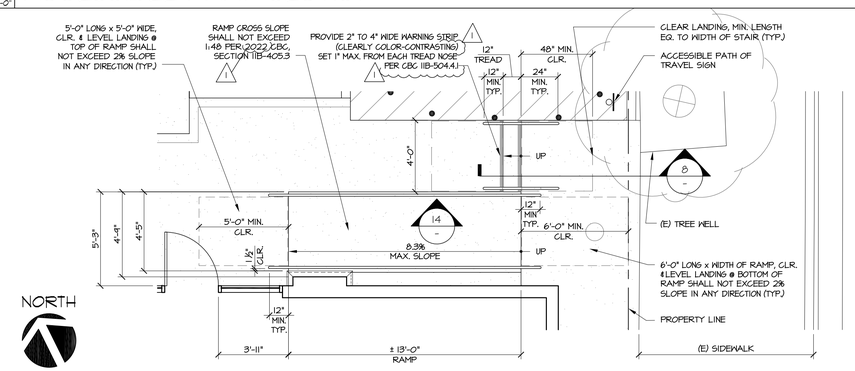
2. STRUCTURAL ANCHORAGE / INSTALLATION FOR EV CHARGING EQUIPMENT SHALL CONFORM TO CHARGING EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. SEE EV CHARGING EQUIPMENT MANUFACTURER'S GUIDELINES FOR CONCRETE PAD SIZE & ANCHORAGE.

MAX. SIDE APPROACH = 48"

15 - NOT USED

14 - ACCESSIBLE RAMP SECTION

1/2" = 1'-0"



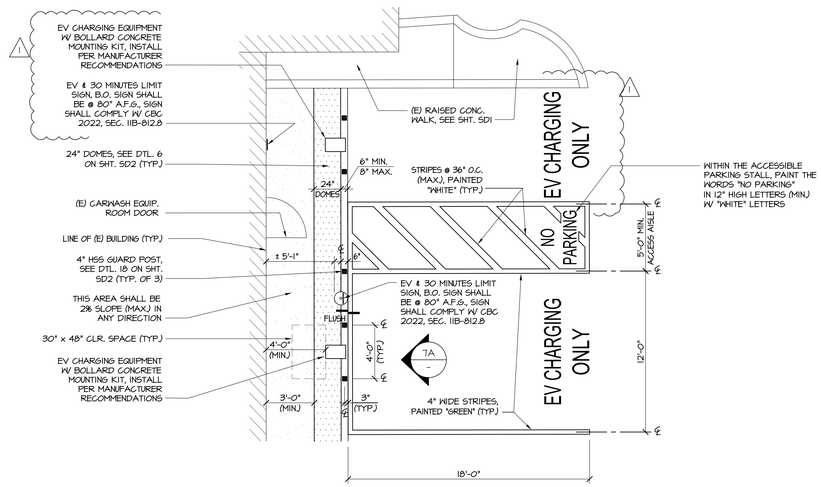
20 - NOT USED

19 - ACCESSIBLE RAMP DETAIL PLAN

1/4" = 1'-0"

17 - EV ACCESSIBLE PARKING STALL (FOR FUTURE USE)

3/16" = 1'-0"



NOTES:

1. FOR EXACT EV ACCESSIBLE PARKING LOCATION, SEE SITE PLAN.
2. PARKING STALL AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPE NOT EXCEEDING (2%) SLOPE IN ALL DIRECTIONS
3. LOCATE PARKING SO THAT THE DISABLED PERSON IS NOT REQUIRED TO WALK OR WHEEL BEHIND OTHER PARKED CARS TO GET TO ENTRANCE OF BUILDING.
4. PATH OF TRAVEL FROM THE ACCESSIBLE PARKING STALL TO THE BUILDING ENTRANCE SHALL NOT EXCEED (2%) SLOPE IN ANY DIRECTION.

NORTH

M I Architects

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REDWOOD CITY, CA 94063

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MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

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04-24-23	ISSUED FOR PLAN CHECK
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NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
△		
△		
△		
△		

SITE DETAILS

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-14-23

SD4

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwg's\Permitting\18-10002-SD4.dwg modified by mistrafter at Dec 08, 2023 - 11:03am

CIVIL IMPROVEMENT PLANS
for
NEW RETAIL BUILDING
on
PARCEL 2
2219 EL CAMINO REAL
REDWOOD CITY, CA 94027

GENERAL NOTES

1. ELEVATIONS AND LOCATIONS OF ALL EXISTING UTILITY CROSSINGS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO START OF ANY CONSTRUCTION AFFECTING SAID LINES. CONTACT USA AT (800) 642–2444 AT LEAST TWO WORKING DAYS PRIOR TO EXCAVATION.
2. ALL APPLICABLE WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF REDWOOD CITY STANDARD TECHNICAL SPECIFICATIONS AND DETAILS, PREPARED IN THE OFFICE OF THE ENGINEERING DIVISION, INCLUDING MODIFICATIONS CONTAINED HEREIN.
3. THE CONTRACTOR SHALL RESTORE ALL DAMAGED, REMOVED OR OTHERWISE DISTURBED WALLS, FENCES, SERVICES, UTILITIES, IMPROVEMENTS OR FEATURES OF WHATEVER NATURE, DUE TO CONTRACTOR'S WORK.
4. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE INSTALLATION OF FACILITIES BY PG&E, PACIFIC BELL, AND CABLE TV INSTALLATION. VALVE BOXES AND MANHOLES, AND STRUCTURES TO BE SET TO GRADE IN CONCRETE AFTER PAVING.
5. ALL STREET MONUMENTS AND OTHER PERMANENT MONUMENTS DISTURBED DURING THE PROCESS OF CONSTRUCTION SHALL BE REPLACED BEFORE ACCEPTANCE OF THE IMPROVEMENTS BY THE CITY ENGINEER.
6. THE CONTRACTOR SHALL GIVE THE CITY ENGINEER TWO WORKING DAYS ADVANCE NOTICE FOR INSPECTION. (415) 780–7380.
7. NO TREES 12" DIAMETER OR LARGER MEASURED BETWEEN 6" AND 36" ABOVE GRADE, SHALL BE REMOVED WITHOUT THE WRITTEN CONSENT OF THE CITY ENGINEER. TREE REMOVALS, IF NECESSARY, SHALL CONFORM TO THE HERITAGE TREE ORDINANCE, ORDINANCE. NO. 1536.
8. FOR LANE CLOSURES, THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN AND OBTAIN APPROVAL OF THE CITY ENGINEER BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE FLAGMEN, CONES OR BARRICADES, AS NECESSARY TO CONTROL TRAFFIC AND PREVENT HAZARDOUS CONDITIONS PER THE WORK AREA TRAFFIC CONTROL HANDBOOK.
9. PEDESTRIAN, PUBLIC ACCESSES, WHEELCHAIR ACCESSES SHALL BE MAINTAINED DURING THE CONSTRUCTION TO THE SATISFACTION OF THE CITY ENGINEER.
10. NO TRENCHES OR HOLES SHALL BE LEFT OPEN OVERNIGHT; USE STEEL PLATING OR HOT–MIX ASPHALT AS REQUIRED TO PROTECT OPEN TRENCHES OVERNIGHT.
11. THE CONTRACTOR SHALL CONTROL DUST AT ALL TIMES AND SWEEP STREETS AS OFTEN AS NECESSARY DURING CONSTRUCTION AS REQUIRED BY THE CITY ENGINEER.
12. ALL REVISIONS TO THIS PLAN MUST BE REVIEWED AND APPROVED BY THE CITY ENGINEER PRIOR TO CONSTRUCTION AND SHALL BE ACCURATELY SHOWN ON REVISED PLANS STAMPED AND SIGNED BY CITY ENGINEER PRIOR TO THE INSTALLATION OF THE IMPROVEMENTS.
13. ALL CONSTRUCTION STAKING FOR CURB, GUTTER, SIDEWALK, SANITARY SEWERS, STORM DRAINS, WATER LINES, FIRE HYDRANTS, ELECTROLIERS, ETC., SHALL BE DONE BY A REGISTERED CIVIL ENGINEER OR LICENSED LAND SURVEYOR.

WATER NOTES

1. ALL LABOR AND MATERIALS SHALL MEET REQUIREMENTS OF THE CITY OF REDWOOD CITY.
2. CITY OF REDWOOD CITY INSPECTOR MUST BE NOTIFIED AT 780–7380, AT LEAST TWO FULL WORKING DAYS PRIOR TO EXCAVATING ~~FOR~~ OR CONNECTING TO EXISTING WATER SYSTEM. ONLY THE CITY SHALL OPERATE EXISTING SYSTEM VALVES.
3. STANDARD THRUST BLOCK SHALL BE PROVIDED AT ALL BENDS GREATER THAN 10 DEGREES AND AT ALL CROSSES, TEES, WYES, CAPS, PLUGS, VALVES AND HYDRANTS. SEE STANDARD DETAIL W7 AND W8.
4. PROVIDE 36 INCH MINIMUM COVER FROM ROADWAY SURFACE OVER MAINS; MAINTAIN A ONE FOOT VERTICAL AND FIVE FOOT HORIZONTAL MINIMUM CLEARANCE FROM EXISTING UTILITIES. WATER MAINS SHALL BE INSTALLED ABOVE SANITARY SEWERS.
5. CONTRACTOR SHALL USE HAND TOOLS WHEN EXCAVATING NEAR ALL WATER, SEWER, STORM, GAS, ELECTRIC, COMMUNICATION AND CABLE LINES.
6. ALL TAPPED CONNECTIONS (DOMESTIC AND FIRE) SHALL BE "WET–TAPPED". WET TAPS WILL BE PERFORMED BY THE CITY OF REDWOOD CITY AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL FURNISH TAPPING SLEEVE PER CITY STANDARDS AND DO ALL EXCAVATING, INSTALLING THRUST BLOCKS AND BACKFILLING. CONTRACTOR SHALL CONTACT THE PUBLIC WORKS SERVICES DEPARTMENT AT 780–7464 FOR AN ESTIMATED COST OF THE WET TAP.
7. METERS ARE INSTALLED BY THE CITY OF REDWOOD CITY UPON PAYMENT OF METER CHARGE BY OWNER/DEVELOPER.
8. COMPACTION, TESTING AND INSPECTION COSTS SHALL BE PAID FOR BY THE CONTRACTOR.
9. PRESSURE, CHLORINATION AND LEAKAGE TESTS SHALL BE PERFORMED BY CONTRACTOR. SAMPLING POINTS WILL BE SELECTED BY THE CITY. BACTERIOLOGICAL TESTS SHALL BE PERFORMED BY AN APPROVED COMMERCIAL TESTING LABORATORY. BACTERIOLOGICAL AND DISINFECTION TESTS SHALL BE PAID FOR BY THE OWNER, DEVELOPER, OR CONTRACTOR.

"GRADING CERTIFICATE" (TO BE SIGNED AT PROJECT COMPLETION)

"Prior to occupancy, a licensed civil engineer shall certify to the City Engineer that the site has been graded to the elevations shown on the Plan, and that the site will drain properly."

R.C.E./R.G.E.

(Signature) (Date)

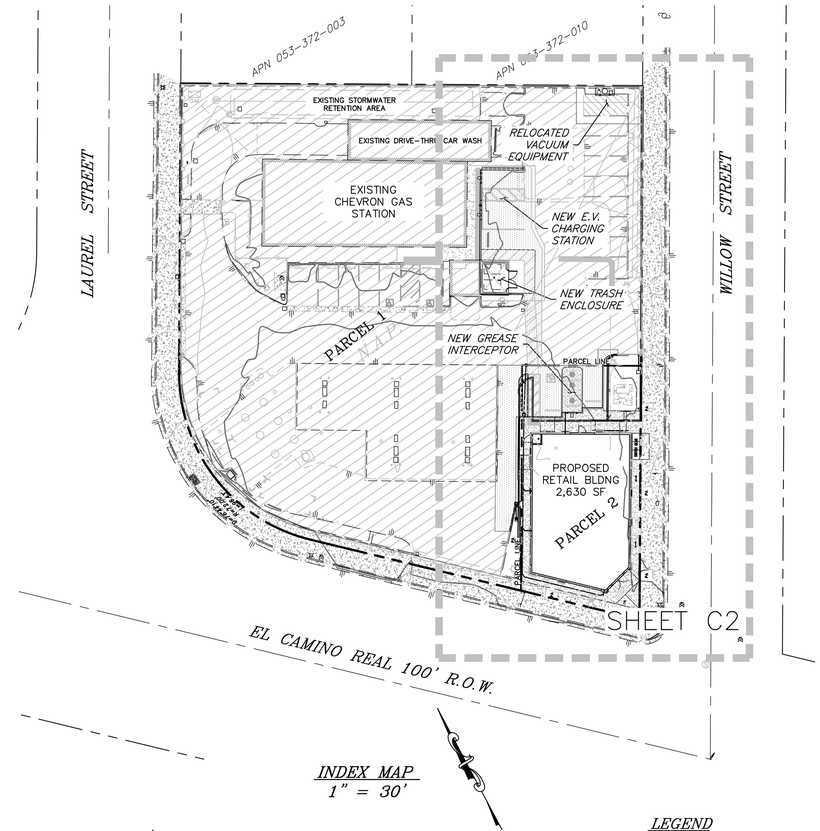
RECORD DRAWINGS (TO BE SIGNED AT PROJECT COMPLETION)

These Record Drawings are based on limited field review and field surveys, as necessary by _____, and we and the City of Redwood City assume no liability for the accuracy of the information.

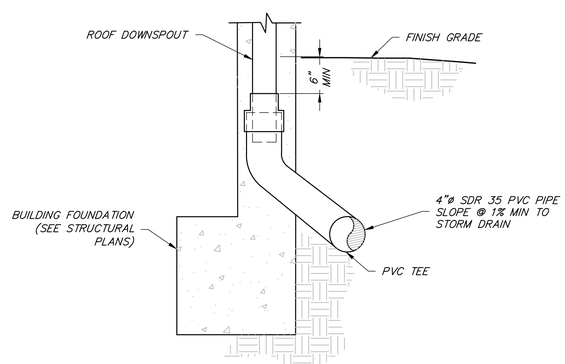
RCE/LLS/AIA/C-16, as appropriate

(Signature) (Date)

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USA
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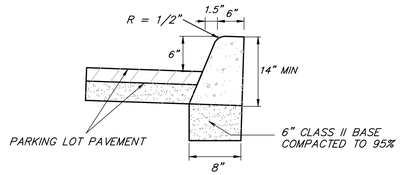
INDEX MAP
1" = 30'



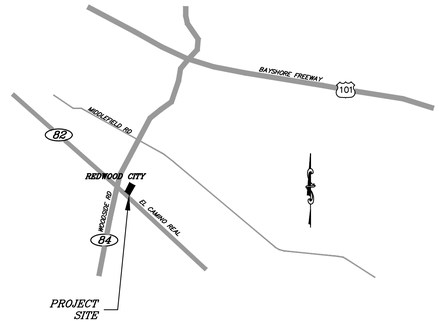
8 ROOF DOWNSPOUT CONNECTION
NTS

LEGEND

PREVIOUS IMPROVEMENTS. NOT A PART OF THIS PROJECT



2 CURB DETAIL
NTS



VICINITY MAP
N.T.S.

SHEET INDEX

SHEET C1 – TITLE SHEET
SHEET C2 – GRADING & DRAINAGE PLAN
SHEET C3 – UTILITY PLAN
SHEET C4 – EROSION CONTROL PLAN
SHEET C5 – CITY STANDARD DETAILS

DEVELOPER
VARUN ENTERPRISES
2215 EL CAMINO REAL
REDWOOD CITY, CA 94063
(650) 630–8588
ATTN: BALDEV MANN

ARCHITECT
M I ASSOCIATES, INC
1801 OAKLAND BLVD, STE. 300
WALNUT CREEK, CA 94596
(925) 287–1174
ATTN: MUTHANA IBRAHIM

CIVIL ENGINEER/SURVEYOR
TRIAD/HOLMES ASSOCIATES
777 WOODSIDE ROAD #2A
REDWOOD CITY, CA 94061
CONTACT: MATTHEW B. PETRONI
(760) 934–7588

BENCHMARK
CITY OF REDWOOD BENCHMARK BM36

Location: El Camino Real at Locust St. Top of disc on curb, at Y for North/South El Camino Real, East side of street.

ELEVATION = 27.15'

BASIS OF BEARING
NONE

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
BOS	BOTTOM OF STAIR
CL	CENTERLINE
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
EG	EXISTING GRADE
EP	EDGE OF PAVEMENT
EX, EXIST	EXISTING
FG	FINISHED GRADE
FL	FLOW LINE
FS	FINISHED SURFACE
INV	INVERT
NTS	NOT TO SCALE
PA	PLANTER
PL	PROPERTY LINE
SSMH, SMH	SEWER MANHOLE
SS	SANITARY SEWER
TC	TOP OF CURB
TF	TOP OF FOOTING
TG	TOP OF GRADE
TOS	TOP OF STAIR
TW	TOP OF WALL
WV	WATER VALVE

LEGEND

- PROPERTY LINE
- CENTERLINE
- ADJACENT PROPERTY LINE OR RIGHT OF WAY
- EDGE OF PAVEMENT
- 12"P — TREE TYPE & SIZE P=PINE/F=FIR/S=SNAG
- 100S — EXISTING GROUND CONTOUR & ELEV.
- OHU — OVERHEAD UTILITIES
- FIRE HYDRANT
- SEWER MANHOLE
- SS — EXISTING SEWERLINE
- TBM — TEMPORARY BENCHMARK
- 100S — PROPOSED GROUND CONTOUR & ELEV.
- DIRECTION OF RUNOFF

REGISTERED PROFESSIONAL ENGINEER
MATTHEW B. PETRONI
C 69473
EXP. 6/30/24
STATE OF CALIFORNIA
2/8/2024

DATE	SYMBOL	REVISIONS	BY	CHECKED	APPROVED

DESIGNED: MATTHEW B. PETRONI, P.E. C69473
DELINEATED: CHRISTIAN CRAIG ASSISTANT ENGINEER
CHECKED: JAMES O'CONNELL ACTING CITY ENGINEER R.E.# C82662

SUBMITTED DATE _____ APPROVED DATE _____

CITY OF REDWOOD CITY
COMMUNITY DEVELOPMENT AND TRANSPORTATION DEPARTMENT
ENGINEERING AND TRANSPORTATION DIVISION
CALIFORNIA

FILE NO: SCALE: AS SHOWN AUTOCAD DRAWING FILE: 2215 EL CAMINO REAL grade R4.dwg

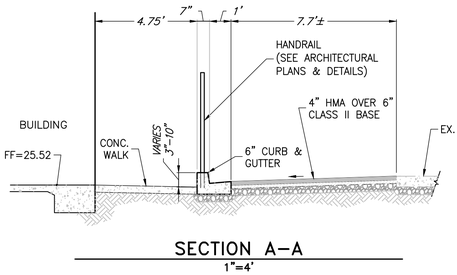
triad/holmes assoc civil engineering land surveying
MAMMOTH LAKES BISHOP REDWOOD CITY

2219 EL CAMINO REAL
TITLE SHEET

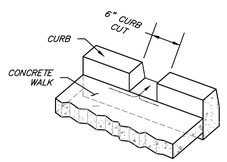
SHEET NO. 1 OF 5 SHEETS

DRAWING NO. 30,481

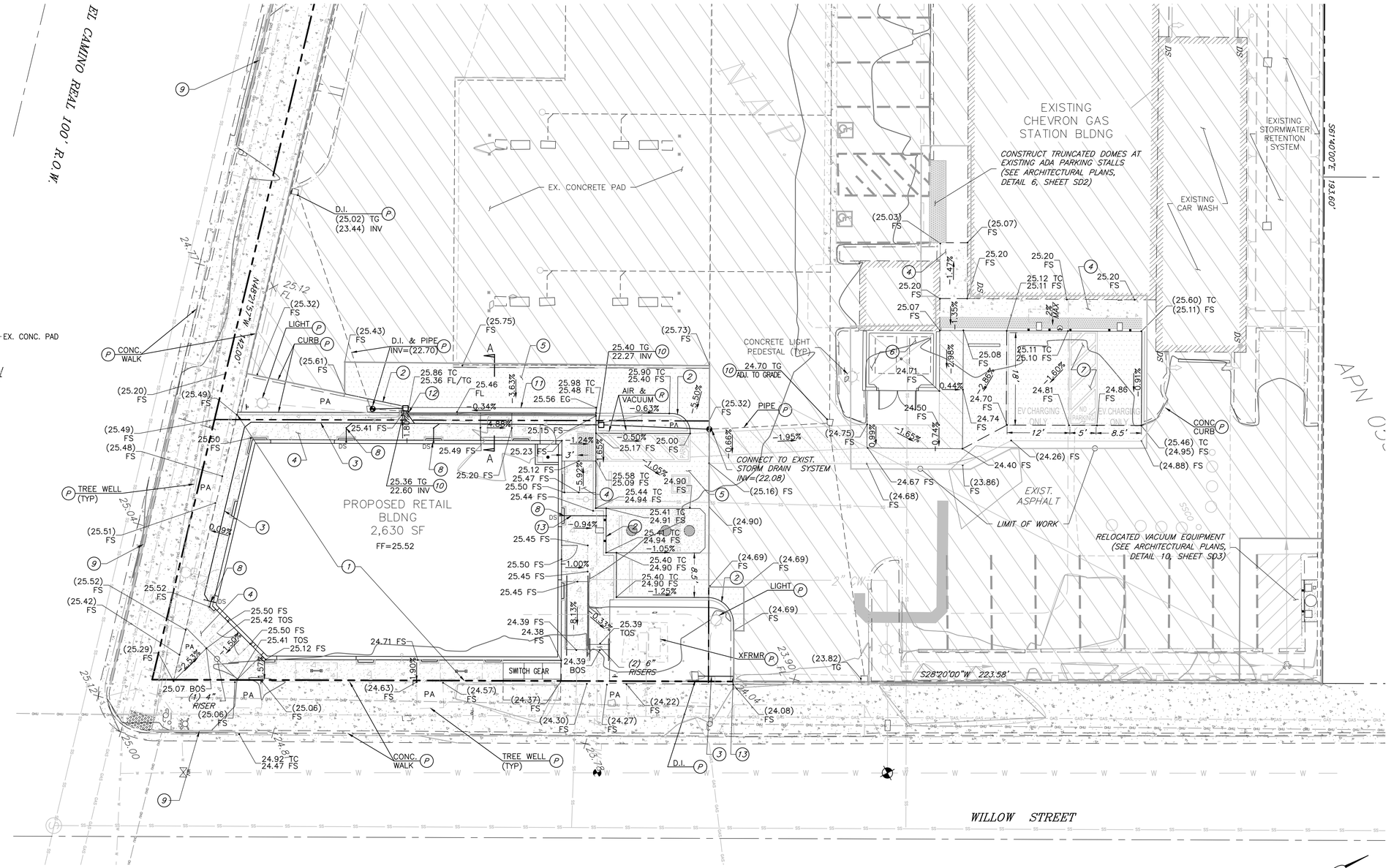
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SECTION A–A
1"=4'



12 CURB CUT



CONSTRUCTION NOTES

(R) REMOVE/RELOCATE PER OWNER INSTRUCTIONS.

(P) PROTECT IN PLACE.

(1) REMOVE EXISTING ASPHALT PAVING AND PREPARE BUILDING PAD PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.

(2) CONSTRUCT 6" CURB PER DETAIL, SHEET 1.

(3) CONSTRUCT 4" SDR35 PVC STORM DRAIN PIPE.

(4) CONSTRUCT SIDEWALK PER REDWOOD CITY STANDARD DETAIL C–5.

(5) CONTRUCT AC PAVING, 4" HMA OVER 6" CLASS II BASE.

(6) CONSTRUCT TRASH ENCLOSURE PER ARCHITECTURAL PLAN DETAILS.

(7) CONSTRUCT EV STATION PER ARCHITECTURAL PLAN DETAILS.

(8) CONSTRUCT DOWNSPOUT CONNECTION TO UNDERGROUND STORM DRAIN SYSTEM PER DETAIL, SHEET C1.

(9) PAINT CURB RED – NO PARKING.

(10) CONSTRUCT 18" SQUARE PREFABRICATED CONCRETE CATCH BASIN WITH TRAFFIC RATED GRATE

(11) CONSTRUCT MODIFIED TYPE "C" CURB & GUTTER PER REDWOOD CITY STANDARD DETAIL C–3.

(12) CONSTRUCT CURB CUT PER DETAIL HEREON.

(13) CONSTRUCT 3"ø DIP STORM DRAIN PIPE THROUGH CURB FACE PER REDWOOD CITY STANDARD DETAIL C–7.

NOTE:
THE PAVEMENT RESTORATION OF THE FRONTAGE STREETS SHALL BE IDENTIFIED, REPAIR OF ALL DAMAGED PAVEMENT DUE TO CONSTRUCTION IS THE MINIMUM. WILLOW STREET SHOULD BE SPOT REPAIR AND SLURRY.

LEGEND

- PREVIOUS IMPROVEMENTS. NOT A PART OF THIS PROJECT
- EXISTING CONCRETE
- NEW CONCRETE
- NEW ASPHALT

GRAPHIC SCALE
10 0 5 10
(IN FEET)
1 inch = 10 ft.

800-227-2600
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UNDERGROUND SERVICE ALERT

REGISTERED PROFESSIONAL ENGINEER
MATTHEW B. PETRONI
C 69473
EXP 6/30/24
CIVIL
STATE OF CALIFORNIA
2/8/2024

DATE	SYMBOL	REVISIONS	BY	CHECKED	APPROVED

DESIGNED: MATTHEW B. PETRONI, P.E. C69473
DELINEATED:
CHECKED:
SUBMITTED / APPROVED
CHRISTIAN CRAIG ASSISTANT ENGINEER
JAMES O'CONNELL ACTING CITY ENGINEER R.E.# C82662

CITY OF REDWOOD CITY
COMMUNITY DEVELOPMENT AND TRANSPORTATION DEPARTMENT
ENGINEERING AND TRANSPORTATION DIVISION
CALIFORNIA

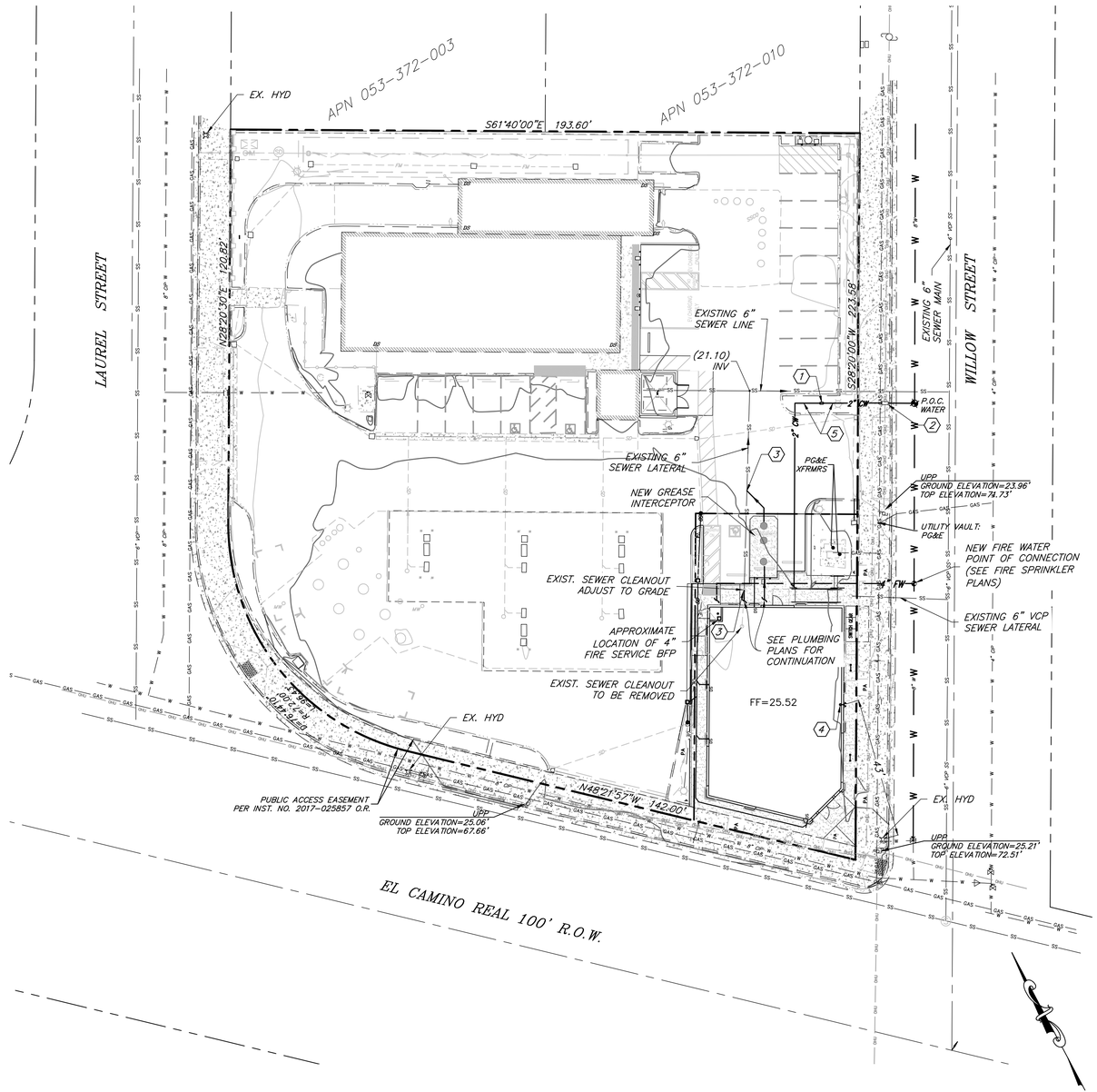
FILE NO:
SCALE: AS SHOWN
AUTOCAD DRAWING FILE: 2215 EL CAMINO REAL grade R4.dwg

thd triad/holmes assoc civil engineering land surveying
MAMMOTH LAKES
BISHOP
REDWOOD CITY

2219 EL CAMINO REAL
GRADING & DRAINAGE PLAN

SHEET NO. 2 OF 5 SHEETS
DRAWING NO. 30,482

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GRAPHIC SCALE

20 0 10 20

(IN FEET)

1 inch = 20 ft.

UTILITY CONSTRUCTION NOTES

1. CONSTRUCT 2" RPV (ZURN 950XL3 OR APPROVED EQUAL).
2. CONSTRUCT 1-1/2" WATER METER WITH 2" SERVICE LATERAL PER REDWOOD CITY STANDARD DETAIL W-1.
3. CONNECT 6" ABS TO EXISTING SEWER LATERAL/CLEANOUT.
4. CONSTRUCT 2-½", WALL MOUNTED, SIAMESE FIRE DEPARTMENT CONNECTION.
5. CONSTRUCT 2" DISTRIBUTION LINE TO BUILDING; CLASS 200 PE PIPE.

800-227-2600

CALL BEFORE YOU DIG UNDERGROUND SERVICE ALERT

REGISTERED PROFESSIONAL ENGINEER MATTHEW B. PETRONI C 69473 EXP 6/30/24 STATE OF CALIFORNIA

2/8/2024

DATE	SYMBOL	REVISIONS	BY	CHECKED	APPROVED

DESIGNED: MATTHEW B. PETRONI, P.E. C69473 — DATE _____ SUBMITTED DATE _____ APPROVED DATE _____

DELINEATED: CHRISTIAN CRAIG ASSISTANT ENGINEER — DATE _____ SUBMITTED DATE _____ APPROVED DATE _____

CHECKED: JAMES O'CONNELL ACTING CITY ENGINEER R.E.# C82662 — DATE _____ APPROVED DATE _____

CITY OF REDWOOD CITY

COMMUNITY DEVELOPMENT AND TRANSPORTATION DEPARTMENT
ENGINEERING AND TRANSPORTATION DIVISION
CALIFORNIA

FILE NO: | SCALE: AS SHOWN | AUTOCAD DRAWING FILE: 2215 EL CAMINO REAL grade R4.dwg

thd triad/holmes assoc civil engineering land surveying

MAMMOTH LAKES
BISHOP
REDWOOD CITY

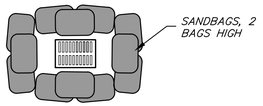
2219 EL CAMINO REAL

UTILITY PLAN

SHEET NO. 3 OF 5 SHEETS

DRAWING NO. 30,483

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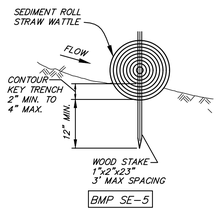


DROP INLET

BMP SE-10

1 STORM DRAIN INLET PROTECTION

N.T.S.

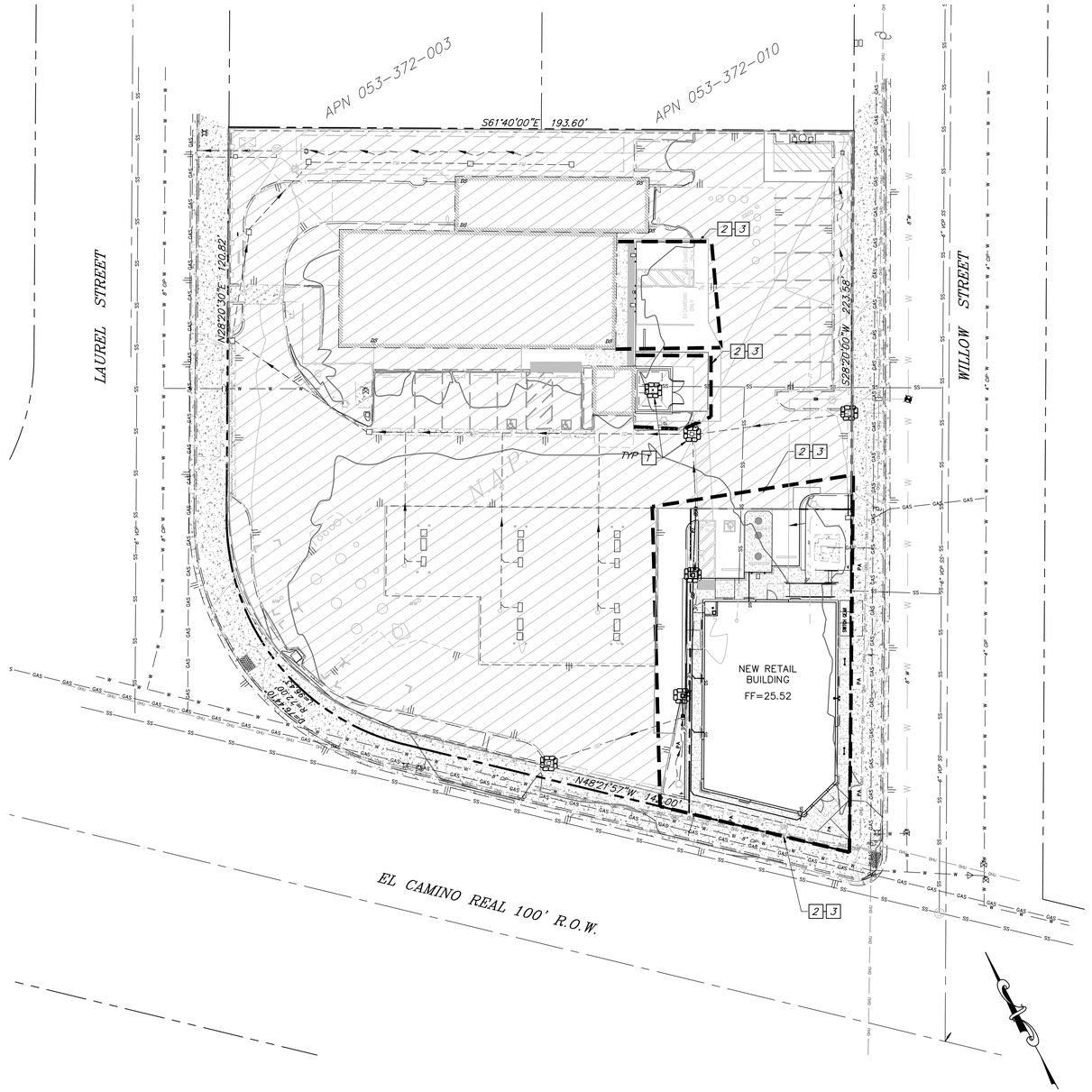


BMP SE-5

2 FIBER ROLL DETAIL

NOTE TO CONTRACTOR:

ALL AREAS THAT ARE NOT COVERED WITH STRUCTURES OR PAVING, INCLUDING AREAS CLEARED FOR CONSTRUCTION OR CONVENIENCE, ARE TO BE PROTECTED FROM EROSION DURING THE RAINY SEASON (OCTOBER 1st TO APRIL 30th) AND RE-VEGETATED OR LANDSCAPED FOR PERMANENT EROSION CONTROL.



GRAPHIC SCALE

20 0 10 20

(IN FEET)
1 inch = 20 ft.

LEGEND

PREVIOUS IMPROVEMENTS. NOT A PART OF THIS PROJECT

EROSION CONTROL CONSTRUCTION NOTES

1 INSTALL DROP INLET PROTECTION PER DETAIL HEREON.

2 INSTALL FIBER ROLL PER DETAIL HEREON.

3 INSTALL 6' TALL TEMPORARY SCREEN FENCING.

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REGISTERED PROFESSIONAL ENGINEER
MATTHEW B. PETRONI
C 69473
EXP 6/30/24
CIVIL
STATE OF CALIFORNIA

2/8/2024

DATE	SYMBOL	REVISIONS	BY	CHECKED	APPROVED

DESIGNED: MATTHEW B. PETRONI, P.E. C69473 — DATE

DELINEATED: CHRISTIAN CRAIG ASSISTANT ENGINEER — DATE

CHECKED: JAMES O'CONNELL ACTING CITY ENGINEER R.E.# C82662 — DATE

SUBMITTED — DATE

APPROVED — DATE

CITY OF REDWOOD CITY

COMMUNITY DEVELOPMENT AND TRANSPORTATION DEPARTMENT
ENGINEERING AND TRANSPORTATION DIVISION
CALIFORNIA

FILE NO:

SCALE: AS SHOWN

AUTOCAD DRAWING FILE: 2215 EL CAMINO REAL grade R4.dwg

triad/holmes assoc. civil engineering land surveying

MAMMOTH LAKES
BISHOP
REDWOOD CITY

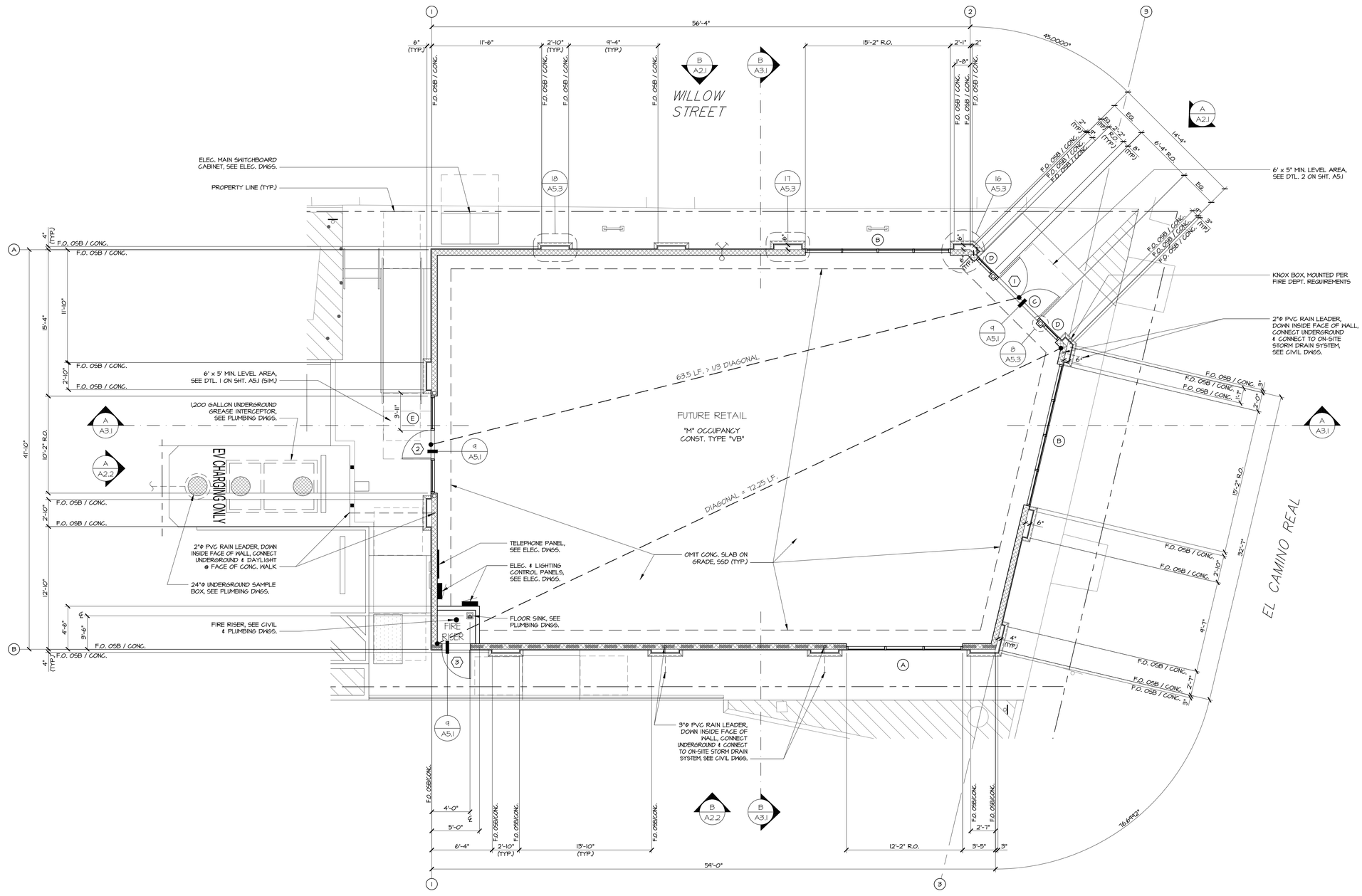
2219 EL CAMINO REAL

EROSION CONTROL PLAN

SHEET NO. 4 OF 5 SHEETS

DRAWING NO. 30,484

Z:\09 RWC\9-1630.1 2215 El Camino Real_Parcel 2\dwg\2215 EL CAMINO REAL grade R4.dwg Feb 08,2024 - 12:16pm mpetroni



1 **FLOOR PLAN**
3/16" = 1'-0"

5 0 5 10 FEET
GRAPHIC SCALE: 3/16" = 1'-0"

NORTH

NOTE:
FOR DOOR SCHEDULE, DOOR TYPES, DOOR HARDWARE & NOTES, STOREFRONT NOTES & WINDOW SCHEDULE, SEE SHT. A1.2

FLOOR PLAN NOTES

1. EXTERIOR WALL DIMENSIONS ARE TO FACE OF CONC. FOUNDATION, SHEATHING (U.O.N.). FLOOR SINK DIMENSIONS ARE FROM FACE OF CONC. FOUNDATION (U.O.N.) INTERIOR WALL DIMS ARE TO FACE OF STUD (U.O.N.) ALL MIN. AND CLEAR DIMENSIONS ARE TO AND FROM FACE OF FINISH.
2. ACCESSIBILITY DESIGN STANDARD: A.D.A. ACCESSIBILITY GUIDELINES, 2010 ADAAG & 2022 CBC CHAPTER 11B.
3. ALL SEALANT TO BE PAINTABLE.
4. PROVIDE 2A:10BC RATED PORTABLE FIRE EXTINGUISHERS WITHIN A 75-FOOT RADIUS OF EACH OTHER, PER FIRE DEPARTMENT REQUIREMENTS, LOCATIONS AS APPROVED BY THE FIRE MARSHALL. MOUNTING HEIGHT SHALL NOT EXCEED 48", PER 2022 CFC, SEC. 906.9. ALL FIRE EXTINGUISHERS SHALL BE MOUNTED IN EASILY ACCESSIBLE LOCATIONS, FREE OF OBSTRUCTIONS. SIGNS MAY BE REQUIRED WHEN EXTINGUISHER IS NOT READILY VISIBLE, PER 2016 CFC, SECTION 906.
5. ALL H.M. DOORS, DOOR FRAMES AND HARDWARE ARE AVAILABLE FROM UNIVERSAL MANUFACTURING CO.
6. ALL CONDUITS SHALL BE INSTALLED WITHIN WALLS WHERE PRACTICAL. CONDUITS INSTALLED OUTSIDE OF WALLS ARE TO BE SPACED AWAY FROM WALLS TO FACILITATE CLEANING.
7. THE ENTIRE FACILITY MUST BE ADEQUATELY VERMIN-PROOFED TO PREVENT THE ENTRANCE AND HARBORAGE OF RODENTS AND OTHER VERMIN, PER HEALTH DEPT. REQUIREMENTS.
8. A KNOX BRAND BOX SHALL BE INSTALLED ON THE PREMISES TO FACILITATE EMERGENCY ACCESS TO THE BUILDING. KNOX BOXES SHALL BE MOUNTED ON THE RIGHT SIDE OF EACH MAIN ENTRANCE. EXACT LOCATION & MOUNTING HEIGHT, PER FIRE DEPT REQUIREMENTS.
9. ALL WOOD FRAMING MEMBERS IN CONTACT WITH CONCRETE OR CMU SHALL BE PRESSURE TREATED DOUGLAS FIR U.O.N. (TYP.)

WALL TYPE LEGEND

2 x 6 STUDS W/ R-21 PAPER FACED BATT INSULATION W/ ⅞" CEMENT PLASTER ON METAL LATH ON (2) LAYERS GRADE "D" BLDG. PAPER ON ½" OSB SHEATHING ON EXTERIOR, SEE DTL. 18 ON SHEET A5.1 (STC 50 MIN).

(2) HOUR FIRE-RESISTANT RATED WALL, SEE WALL SECTION #19 ON SHT. A3.2 & DTL. 13 ON SHT. A5.1

2 x 4 STUD WALLS W/ 5/8" GYP. BD. ON EACH FACE U.O.N. (PROVIDE WATER RESISTANT GYP. BD. @ WET AREAS), SEE DTL. 17 ON SHEET A5.1

M I Architects

M I Architects, Inc.
ARCHITECTURE
PLANNING
MANAGEMENT
DESIGN
1801 OAKLAND BLVD.,
SUITE 300
WALNUT CREEK, CA
94596
925-287-1174 Tel
925-443-1581 Fax
925-878-9875 Cell
muthana@mlarchitect.com
www.mlarchitect.com

NOT FOR CONSTRUCTION

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PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
04-24-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
2		
3		
4		
5		

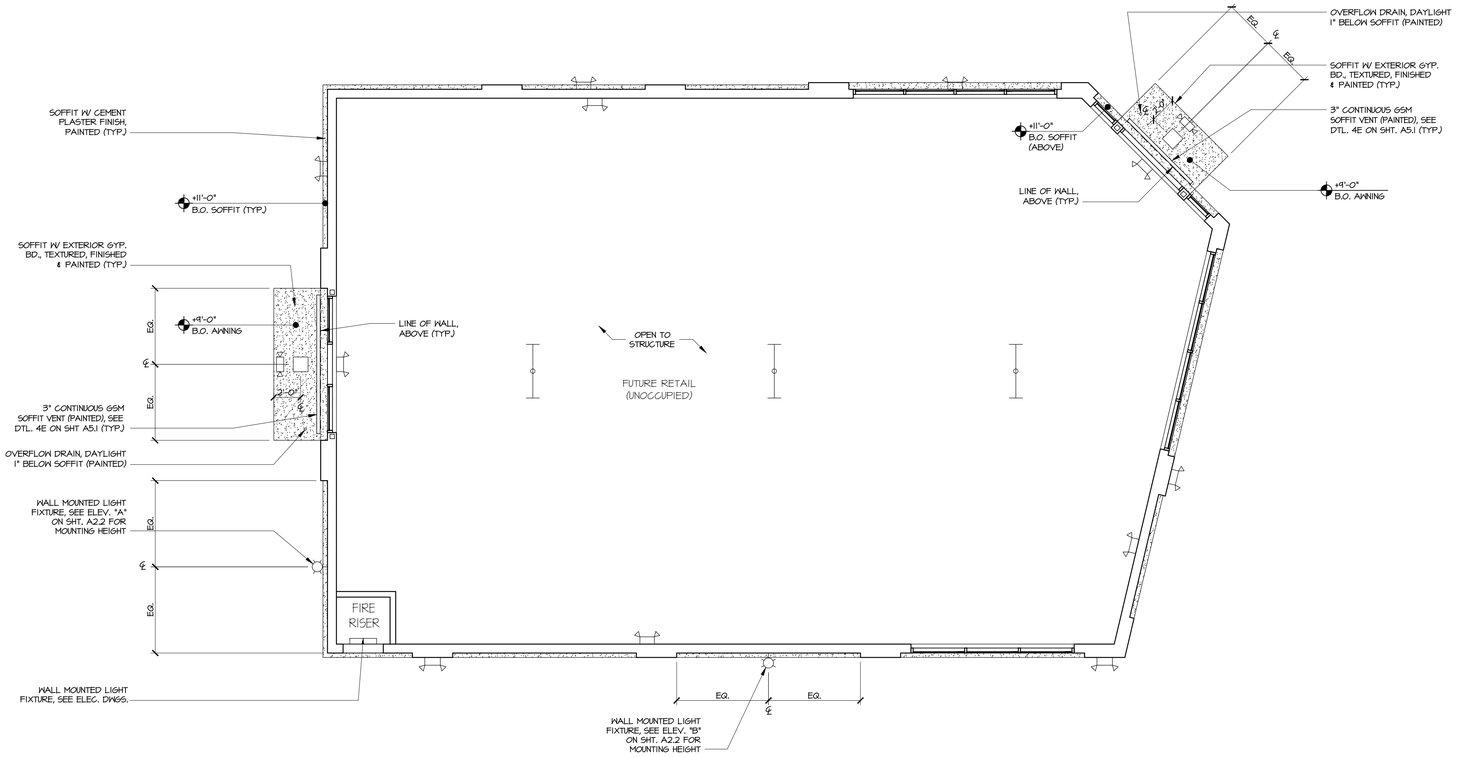
FLOOR PLAN, NOTES & WALL TYPE LEGEND

PROJECT #: 18-10002
DRAWN: JM / EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

A1.1

SHEET OF

S:\1-Projects\18-10002 Retail 2219 El Camino Real\Dwgs\Permitting\18-10002-A1.1.dwg modified by miauser4 at Jan 24, 2024 - 2:08pm



1 REFLECTED CEILING PLAN

3/16" = 1'-0"

5 0 5 10 FEET

GRAPHIC SCALE: 3/16" = 1'-0"

NORTH

CEILING PLAN SYMBOLS

- WALL MOUNTED LED EXTERIOR LIGHT FIXTURE (LISTED FOR WET USE)
- 1' x 4' LED LIGHTING (SUSPENDED FROM STRUCTURE)
- RECESSED EXTERIOR SOFFIT LIGHT (LISTED FOR WET USE)
- WALL OR CEILING MOUNTED EMERGENCY LIGHTING

NOTES

1. SEE ELECTRICAL AND MECHANICAL DRAWINGS FOR FIXTURE SPECIFICATIONS.
2. ALL DIMENSIONS ARE FROM FACE OF FINISH.

DOOR SCHEDULE

MARK	QTY.	DR TYP.	TYPE	MTL. GA.	SIZE	MFR	HDW GROUP	REMARKS
1	1	A	SERIES 375 MEDIUM STILE DOOR	6G/AL	3'-0" x 7'-0" (PAIR)	OLDCASTLE	A	INCLUDE 10" SMOOTH BOTTOM RAIL
2	1	B	SERIES 375 MEDIUM STILE DOOR	6G/AL	3'-0" x 7'-0"	OLDCASTLE	B	INCLUDE 10" SMOOTH BOTTOM RAIL
3	1	C	SC EXTERIOR	18	1 3/4" x 3'-0" x 7'-0"	UNIVERSAL	C	1 1/2 HOUR FIRE RATED DOOR & FRAME

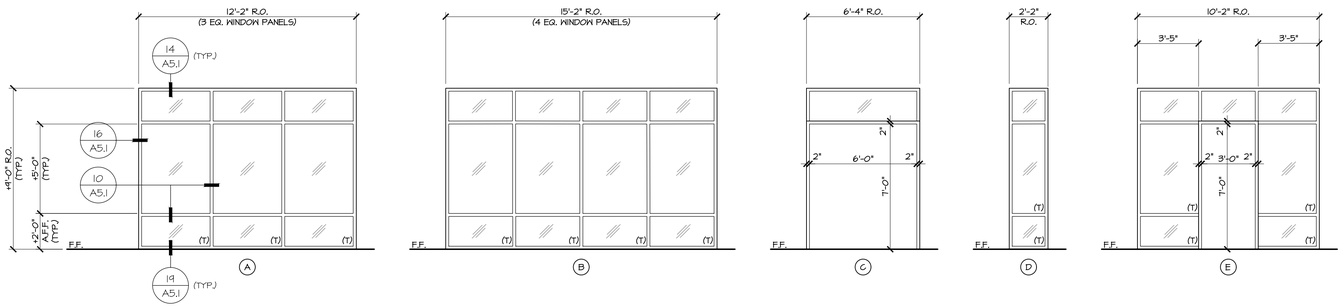
DOOR HARDWARE

GROUP	EQUIPMENT	SPECIFICATION
A	LOCKSET: HINGES: CLOSER: THRESHOLD:	1 PAIR PH-12 OFFSET ALUMINUM PULL, 1"Ø W/ US-28 FINISH W/ ADAMS RITE MS 1850 X 4015 X 4085 W/ DARK BRONZE ALUMINUM FINISH 1 PAIR PEMKO CONTINUOUS GEAR HINGE (DARK BRONZE ALUMINUM FINISH) 1 PAIR LCN CLOSER MODEL NO. 1461 ACCESSIBLE (DARK BRONZE ALUMINUM FINISH) TOP JAMB PEMKO #274-A -36", SEE DTL. 9 ON SHT. A5.1
B	LOCKSET: HINGES: CLOSER: THRESHOLD:	1 PAIR PH-12 OFFSET ALUMINUM PULL, 1"Ø W/ US-28 FINISH W/ ADAMS RITE MS 1850 X 4015 X 4085 W/ DARK BRONZE ALUMINUM FINISH 1 PAIR PEMKO CONTINUOUS GEAR HINGE (DARK BRONZE ALUMINUM FINISH) LCN CLOSER MODEL NO. 1521 ACCESSIBLE (DARK BRONZE ALUMINUM FINISH) TOP JAMB PEMKO #274-A -36", SEE DTL. 9 ON SHT. A5.1
C	LOCKSET: HINGES: CLOSER: THRESHOLD: OTHER:	FALCON T581 LEVER (626 FINISH), MANUAL FLUSH BOLT- PR FB457 3 PAIR HAGER HINGES BB1191 4 1/2" X 4 1/2" (US26D FINISH) NRP LCN CLOSER MODEL NO. 1461 ACCESSIBLE PEMKO #274-A -36", SEE DTL. 9 ON SHT. A5.1 2525 B (BRONZE) NGP FIRE SEAL STAINLESS STEEL DRIP STRIP, NGP MODEL #1666

DOOR NOTES

1. IN CASE OF ANY HARDWARE SUBSTITUTION, CONTRACTOR SHALL NOT USE A LATCH ON ANY DOOR W/ OUT THE USE OF LEVER TYPE HARDWARE.
2. MAXIMUM EFFORT TO OPERATE DOORS SHALL NOT EXCEED 5 POUNDS FOR INTERIOR & EXTERIOR DOORS. SEE DETAIL 17, THIS SHEET FOR DOOR HARDWARE LOCATION.
3. ALL DOOR CLOSERS SHALL BE SELF-CLOSING AND CLOSING SPEED SHALL COMPLY W/ 2022 CBC, 11B-404.2.8:
   11B-404.2.8 CLOSING SPEED. DOOR AND GATE CLOSING SPEED SHALL COMPLY WITH 11B-404.2.8:
   11B-404.2.8.1 DOOR CLOSERS AND GATE CLOSERS. DOOR CLOSERS AND GATE CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO A POSITION OF 12 DEGREES FROM THE LATCH IS 5 SECONDS MINIMUM.
   11B-404.2.8.2 SPRING HINGES. DOOR AND GATE SPRING HINGES SHALL BE ADJUSTED SO THAT FROM THE OPEN POSITION OF 70 DEGREES, THE DOOR OR GATE SHALL MOVE TO THE CLOSED POSITION IN 1.5 SECONDS MINIMUM.
4. THE LOCKS & LATCHES REQUIREMENTS SHALL CONFORM PER 2022 CBC, SECTION 1010.1.9.3. THE LOCKING DEVICE SHALL BE READILY DISTINGUISHABLE AS LOCKED. THE USE OF KEY-OPERATED LOCKING DEVICE IS REVOCABLE BY THE BUILDING OFFICIAL FOR DUE CAUSE.
5. ALL EGRESS DOORS SHALL HAVE SINGLE ACTION HARDWARE/ PANIC HARDWARE & SHALL NOT HAVE A LOCKING MECHANISM IMPEDING EMERGENCY EGRESS.

WINDOW SCHEDULE SCALE: 1/4" = 1'-0"

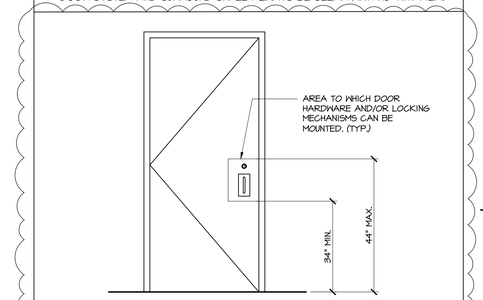


NOTE: CONTRACTOR SHALL VERIFY ALL STOREFRONT ROUGH OPENINGS IN FIELD PRIOR TO ORDERING.

(T) = TEMPERED GLASS

STOREFRONT NOTES

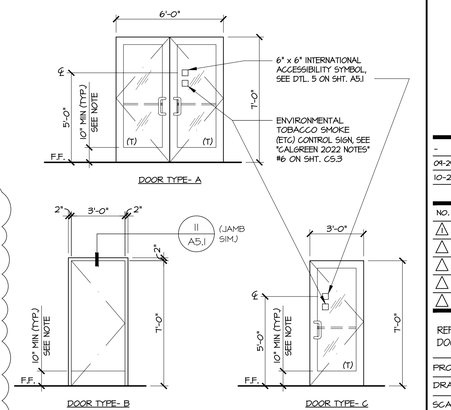
1. STOREFRONT ALUMINUM FRAME AS MANUFACTURED BY OLDCASTLE, SERIES 3000 THERMAL MULTI-PLANE, 2" x 4 1/2" FRONT LOADED GLAZING W/ DARK BRONZE ALUMINUM FINISH, ALTERNATE AND EQUIVALENT STOREFRONT FRAME AS MANUFACTURED BY U.S. ALUMINUM OR OTHER AS APPROVED BY OWNERS REPRESENTATIVE.
2. ALL STOREFRONT GLAZING SHALL BE PPG: SOLARBAN 70XL (2) ON OPTIGRAY + CLEAR GLASS, 1" THERMAL INSULATED, LOW "E" GLAZING (OR APPROVED EQUAL) U.O.N. TEMPERED GLAZING WHERE OCCURS (01TC 30), TYP.
3. VERIFY ALL WINDOW SIZES IN FIELD PRIOR TO FABRICATION.
4. GLAZING AND STOREFRONTS SHALL CONFORM TO LOCAL WIND LOAD REQUIREMENTS. GLAZING MATERIAL THICKNESS, AND LAMINATION AND/OR MULLION DESIGN IS SUBJECT TO CHANGE.
5. ONLY WHEN REQUIRED FOR ENERGY COMPLIANCE. INSTALL TINT FILM ON STOREFRONT INTERIOR. USE MADICO TINT FILM FOR TYPICAL CLIMATES AND SOUTHWALL TECHNOLOGIES FOR EXTREME CLIMATES. INSULATED GLAZING AT ENTRY DOOR SYSTEM AND SURROUND SHALL ALWAYS BE CLEAR WITH NO TINT FILM.



17 DOOR HARDWARE DETAIL

NONE

DOOR TYPES SCALE: 1/4" = 1'-0"



NOTE:

MIN 10" BOTTOM RAIL SHALL BE SMOOTH PER SEC. 11B-404.2.10 (TYP. TO ALL DOORS)

(T) = TEMPERED GLASS

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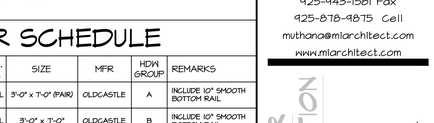
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10-21-14		ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS

REFLECTED CEILING PLAN, DOOR TYPES, DOOR & WINDOW SCHEDULES & NOTES

PROJECT #: 18-10002

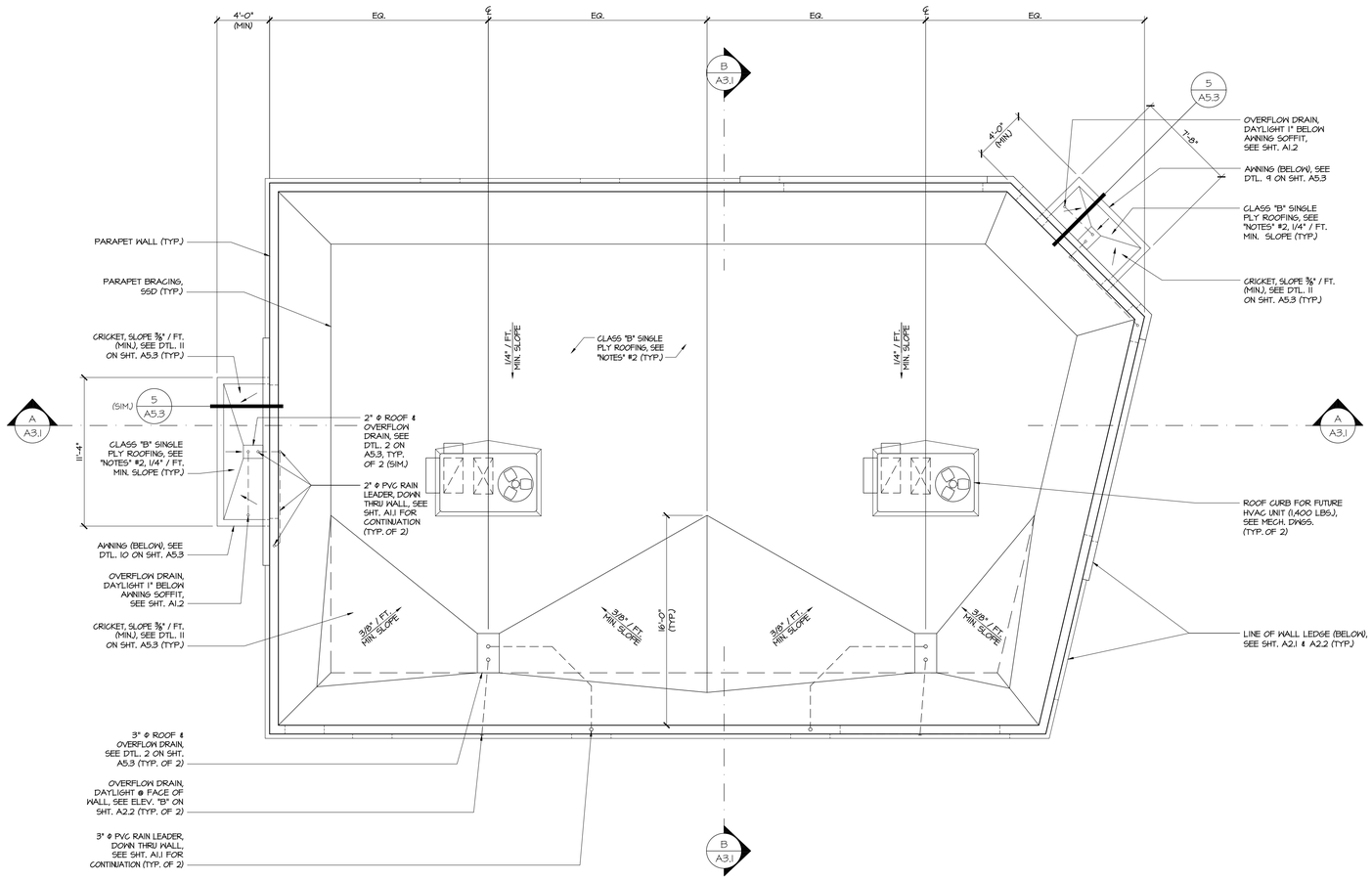
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SCALE: AS NOTED DATE: 04-19-23

A1.2

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1 ROOF PLAN
3/16" = 1'-0"

5 0 5 10 FEET
GRAPHIC SCALE: 3/16" = 1'-0"

NORTH

NOTES

1. FLASH ROOFING MEMBRANE PENETRATIONS USING PREFABRICATED BOOTS, FITTED COVERINGS AND OTHER ACCESSORIES AS REQUIRED BY THE ROOFING MANUFACTURER.
2. ROOFING SHALL BE CLASS "B" FIRE RATED (MIN.), 60-MIL TPO WHITE MEMBRANE COOL ROOF APPLICATION, SRI 110 AND MINIMUM AGED SOLAR REFLECTANCE VALUE OF 0.63 (MIN.) (SINGLE-PLY ROOFING SYSTEM). SINGLE PLY ROOFING SYSTEM SHALL BE FULLY ADHERED ON 2" SECURSHIELD POLYISO RIGID INSULATION ON PLYWOOD DECKING OR ON SLOPED CONCRETE SLAB. CONTRACTOR SHALL PROVIDE (20) YEAR LABOR & MATERIAL WARRANTY & SHALL INSTALL PER MANUFACTURER SPECIFICATIONS, RECOMMENDATIONS & STANDARD DETAIL INSTALLATION.
3. CRICKET SHALL BE PROVIDED FOR ALL ROOF EQUIPMENT. PROVIDE 3% POSITIVE SLOPE TO ROOF DRAIN @ ALL CRICKETS & ASSOCIATED VALLEYS.
4. CONTRACTOR SHALL VERIFY THAT ALL AREAS ARE PROVIDED WITH POSITIVE ROOF DRAINAGE (2% MIN. TYPICAL ENTIRE ROOF).
5. VERIFY MECHANICAL UNIT WEIGHTS WITH SITE SPECIFIC MECHANICAL UNIT SPECIFICATIONS.
6. ALL ROOF TOP EQUIPMENT MUST BE PROVIDED W/ A ROOF CURB AS REQUIRED BY THE EQUIPMENT & ROOFING MANUFACTURERS.

LEGEND

○○	ROOF & OVERFLOW DRAIN, SEE DTL. 2 ON SHT. A5.3
——►	SLOPE DOWN

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

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-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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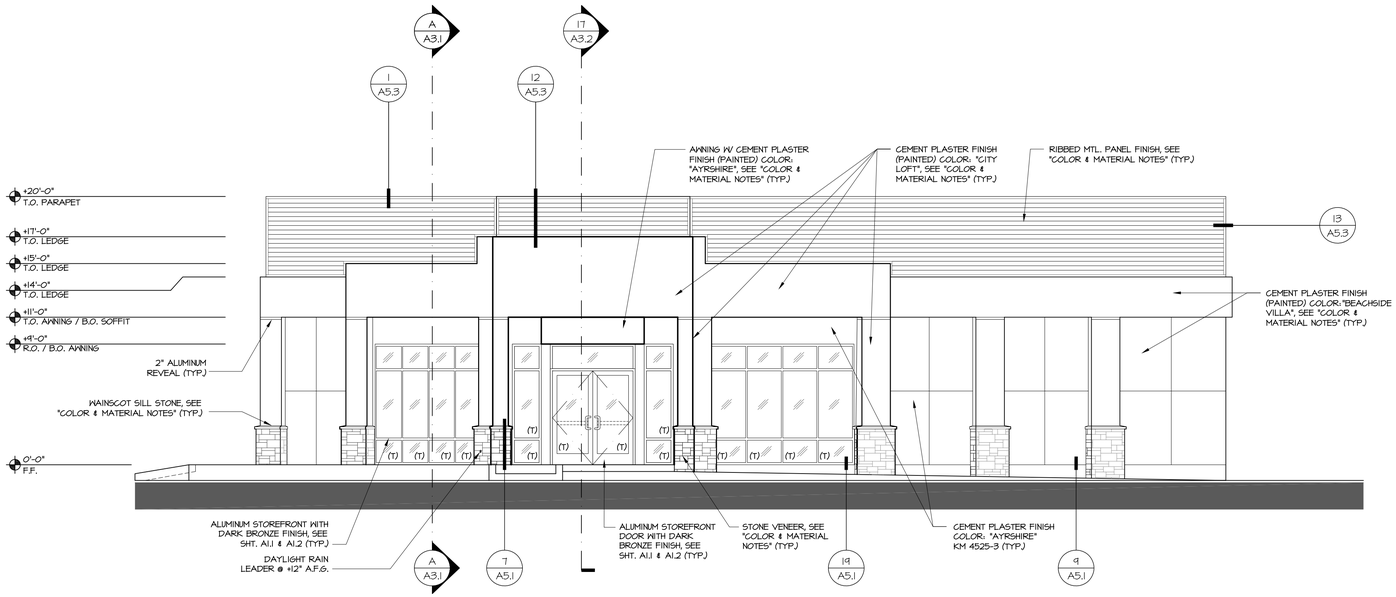
ROOF PLAN & NOTES

PROJECT #: 18-10002
DRAWN: JM / EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

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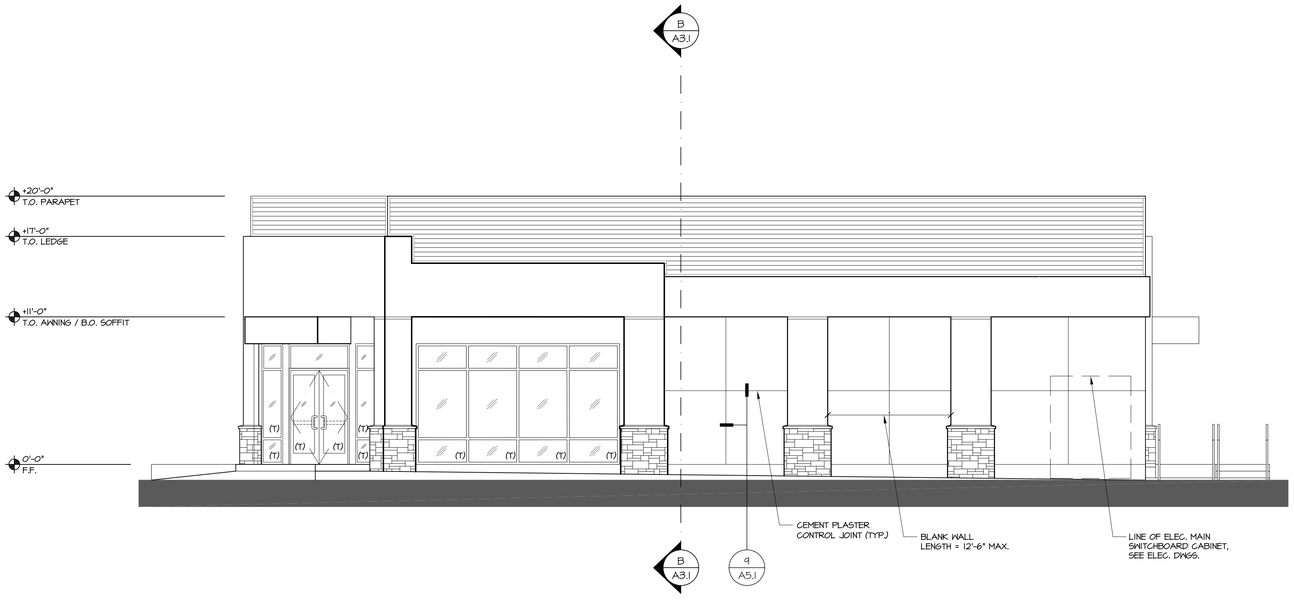
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A SOUTHEAST ELEVATION (EL CAMINO AVE. COR. WILLOW ST.)

3/16" = 1'-0"



B EAST ELEVATION

3/16" = 1'-0"

GRAPHIC SCALE: 3/16" = 1'-0"

5 0 5 10 FEET

NOTE:

WALL SIGNS ARE BY SEPARATE PERMIT

COLOR & MATERIAL NOTES

- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "CITY LOFT" #KM4566-3
- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "BEACHSIDE VILLA" #KM45735-2
- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "AYRSHIRE" #KM4525-3
- WAINSCOT SILL STONE: "ELDORADO STONE" SNAPPED EDGE, COLOR: "SAND"
- STONE VENEER: "ELDORADO STONE", NATIONWIDE PROFILE, CLIFFSTONE, COLOR: "CAMBRIA"
- ALUMINUM STOREFRONT "OLDCASTLE", 140 - DARK BRONZE CLASS 1
- RIBBED METAL PANEL: AEP SPAN, BOX RIB WALL, 24 GA., COOL DURATECH MX, COLOR: "METALLIC SILVER".

GENERAL NOTES

1. THE NUMBER SHALL BE A MINIMUM OF 12 INCH IN HEIGHT WITH A MINIMUM STROKE 1.25 INCHES. THE BUILDING NUMBER SHALL BE PLAINLY VISIBLE AND LEGIBLE FROM THE STREET OR ROAD FRONTING THE BUILDING AND NUMBERS SHALL CONTRAST WITH THEIR BACKGROUND AND SHALL BE EITHER INTERNALLY OR EXTERNALLY ILLUMINATED.
2. PROVIDE SHOP DRAWINGS OF STOREFRONT PRIOR TO FABRICATION, DETAILING MATERIALS, FINISHES, SIZES, PROFILES, CONNECTIONS, ETC.
3. CEMENT PLASTER SHALL BE SMOOTH NATURAL FINISH, PAINTED (TYP.),
4. PAINT TO BE VOC-COMPLIANT URETHANE. SEE TECHNICAL SPECIFICATIONS, SHEET SP.5.
5. ALL PAINT SHALL BE APPROVED BY OWNER REPRESENTATIVE PRIOR TO APPLICATION. PREPARE SURFACE AND APPLY PAINT, PER PAINT MFR. RECOMMENDATIONS.
6. PAINT ALL MECH. AND PLUMBING PENETRATIONS TO MATCH ADJACENT WALL.
7. GLAZING, STOREFRONT, AND DOORS ARE TO BE (T)= TEMPERED, AS NOTED.
8. USE BRASS NOZZLE OVERFLOW @ FACE OF WALL. PAINT TO MATCH ADJACENT WALL.
9. A KNOX BRAND BOX SHALL BE INSTALLED ON THE PREMISES TO FACILITATE EMERGENCY ACCESS TO THE BUILDING. KNOX BOXES SHALL BE MOUNTED ON THE RIGHT SIDE OF EACH MAIN ENTRANCE. EXACT LOCATION & MOUNTING HEIGHT OF KNOX BOX SHALL PER FIRE DEPT REQUIREMENTS.
10. CEMENT PLASTER SHALL BE 3-COATS, 7/8" THICK ON METAL LATH ON (2) LAYERS GRADE "D" BUILDING PAPER ON PLYWOOD (OR OSB) SHEATHING, PER 2022 CBC SECTION 2510.6, 2512.1 & 2512.2.

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C-29627
6/30/2025
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04-24-23		ISSUED FOR PLAN CHECK
10-21-14		ISSUED FOR PLANNING

EXTERIOR ELEVATIONS

PROJECT #: 18-10002

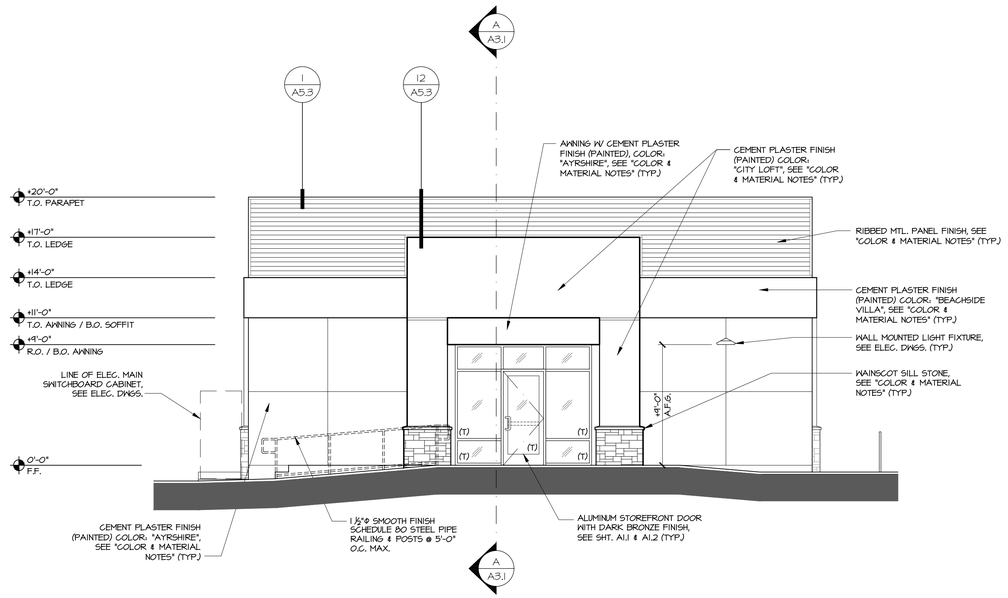
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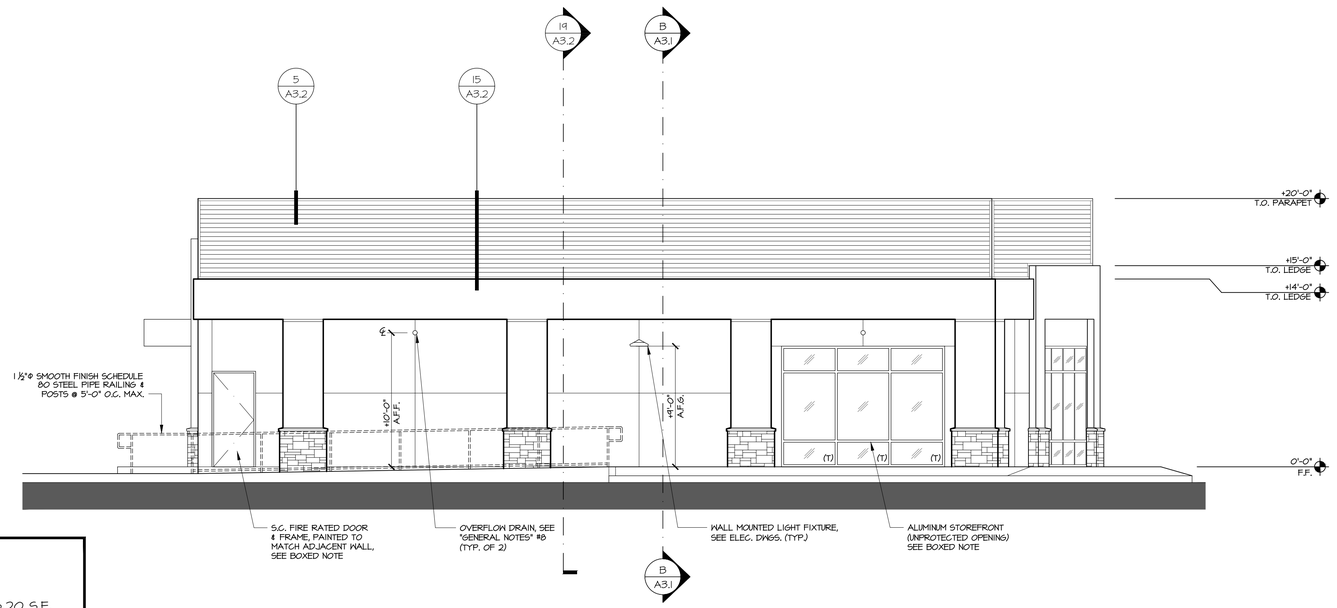
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A NORTH ELEVATION
3/16" = 1'-0"



B WEST ELEVATION
3/16" = 1'-0"

5 0 5 10 FEET
GRAPHIC SCALE: 3/16" = 1'-0"

TOTAL AREA OF WEST WALL = 1,118 S.F.

UNPROTECTED OPENING ALLOWED
PER TABLE 705.8 = 0.15 x 1,118 S.F. = 178.20 S.F.

STOREFRONT (UNPROTECTED OPENING) = 110 S.F.

FIRE RATED DOOR (PROTECTED OPENING) = 24 S.F.

110 S.F. + 24 S.F. = 134 S.F. < 178.20 S.F.

NOTE:

WALL SIGNS ARE BY SEPARATE PERMIT

COLOR & MATERIAL NOTES

- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "CITY LOFT" #KM4566-3
- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "BEACHSIDE VILLA" #KM4513S-2
- CEMENT PLASTER WALL: SAND FINISH (PAINTED) KELLY MOORE, COLOR: "AYRSHIRE" #KM4525-3
- WAINSCOT SILL STONE: "ELDORADO STONE" SNAPPED EDGE, COLOR: "SAND"
- STONE VENEER: "ELDORADO STONE", NATIONWIDE PROFILE, CLIFFSTONE, COLOR: "CAMBRIA"
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- RIBBED METAL PANEL: AEP SPAN, BOX RIB WALL, 24 GA., COOL DURATECH MX, COLOR: "METALLIC SILVER".

GENERAL NOTES

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2. PROVIDE SHOP DRAWINGS OF STOREFRONT PRIOR TO FABRICATION, DETAILING MATERIALS, FINISHES, SIZES, PROFILES, CONNECTIONS, ETC.
3. CEMENT PLASTER SHALL BE SMOOTH NATURAL FINISH, PAINTED (TYP.),
4. PAINT TO BE VOC-COMPLIANT URETHANE. SEE TECHNICAL SPECIFICATIONS, SHEET SP.5.
5. ALL PAINT SHALL BE APPROVED BY OWNER REPRESENTATIVE PRIOR TO APPLICATION. PREPARE SURFACE AND APPLY PAINT, PER PAINT MFR. RECOMMENDATIONS.
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MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

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-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1		
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EXTERIOR ELEVATIONS

PROJECT #: 18-10002

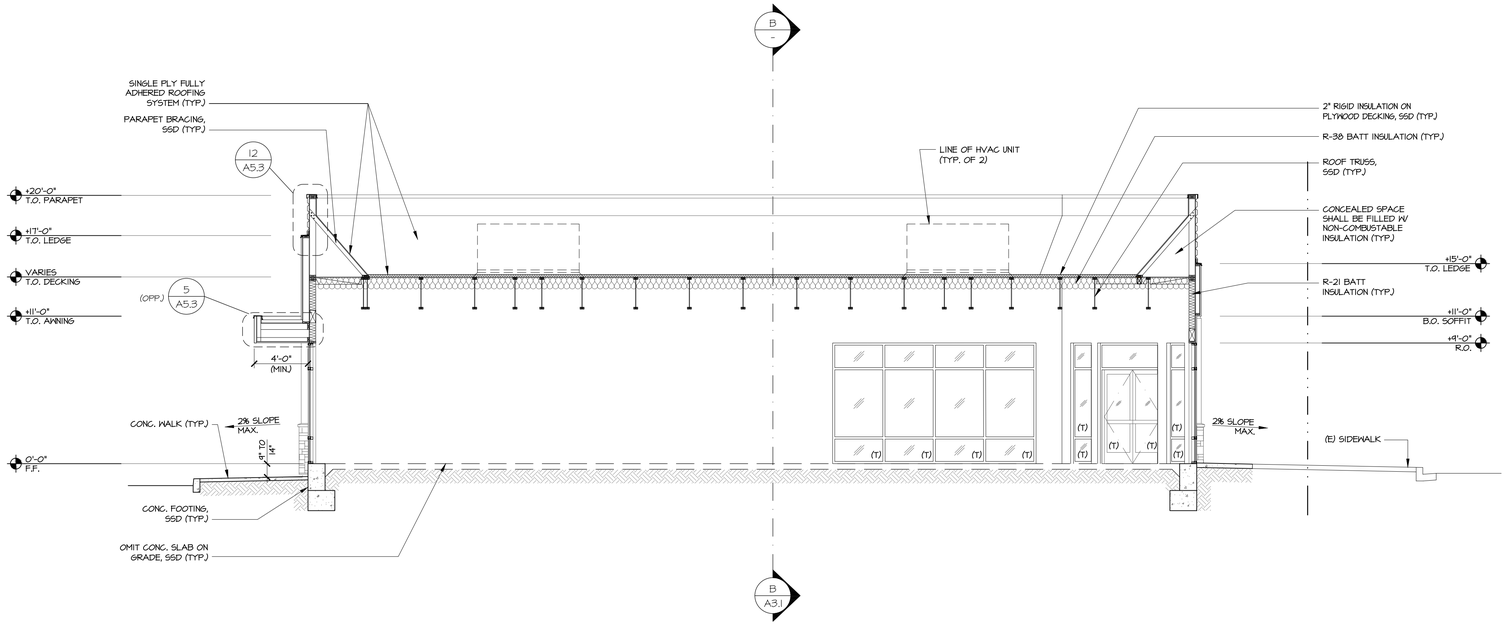
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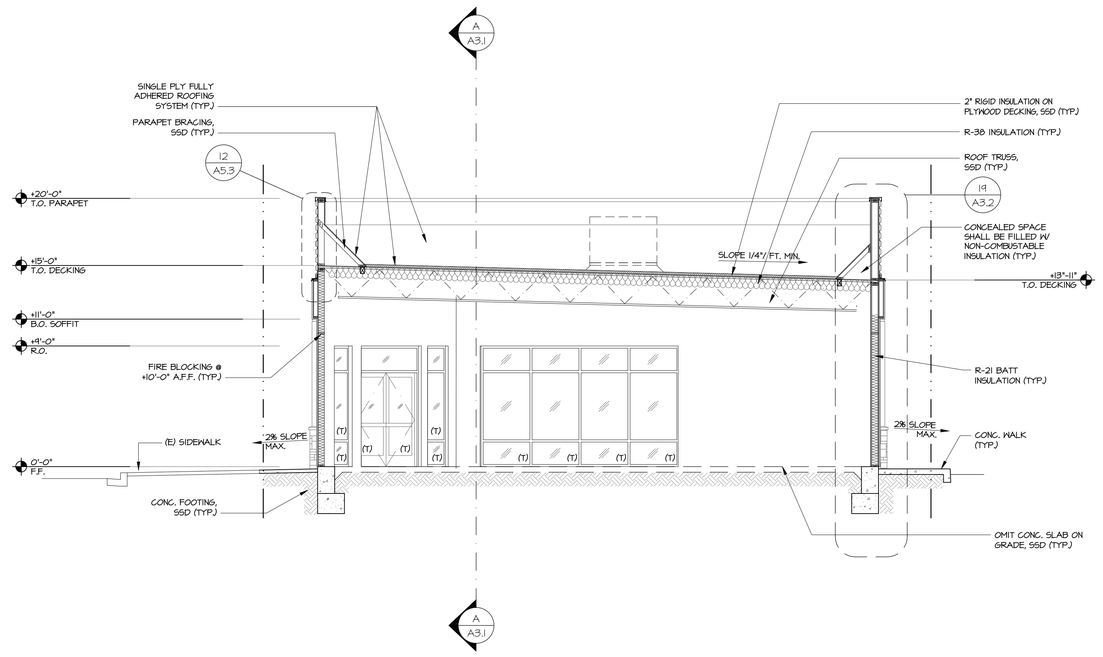
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A BUILDING SECTION A-A

3/16" = 1'-0"



B BUILDING SECTION B-B

3/16" = 1'-0"

THERMAL INSULATION AT EXTERIOR WALLS & BELOW ROOF DECK SHALL BE ECOTOUGH THERMAL BATT INSULATION MANUFACTURED BY OWENS CORNING OR APPROVED EQUAL. INSULATION SHALL COMPLY WITH TIER 1 CALIFORNIA GREEN BUILDING STANDARDS CODE INSULATION SHALL COMPLY W/ CALGREEN 2022, SEC A5.504.4.8

5 0 5 10 FEET

GRAPHIC SCALE: 3/16" = 1'-0"

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BUILDING SECTIONS

PROJECT #: 18-10002

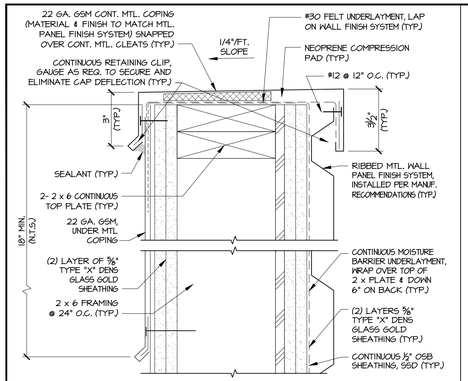
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SCALE: AS NOTED DATE: 04-19-23

A3.1

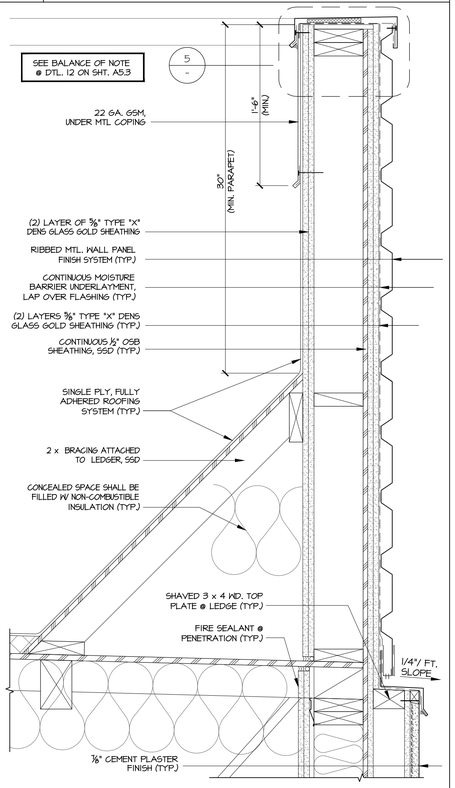
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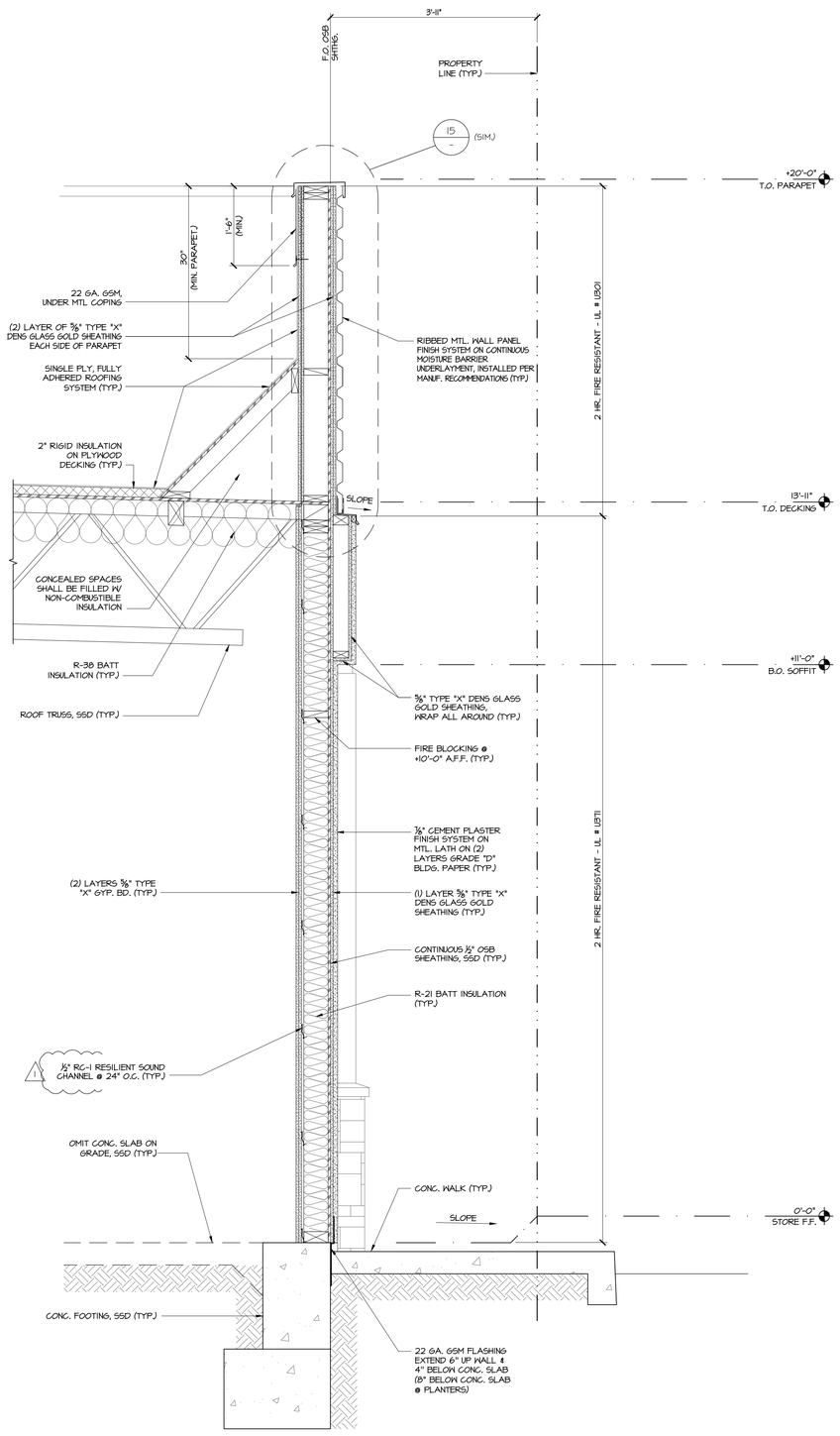
5 — 3" = 1'-0"

COPING @ RATED PARAPET



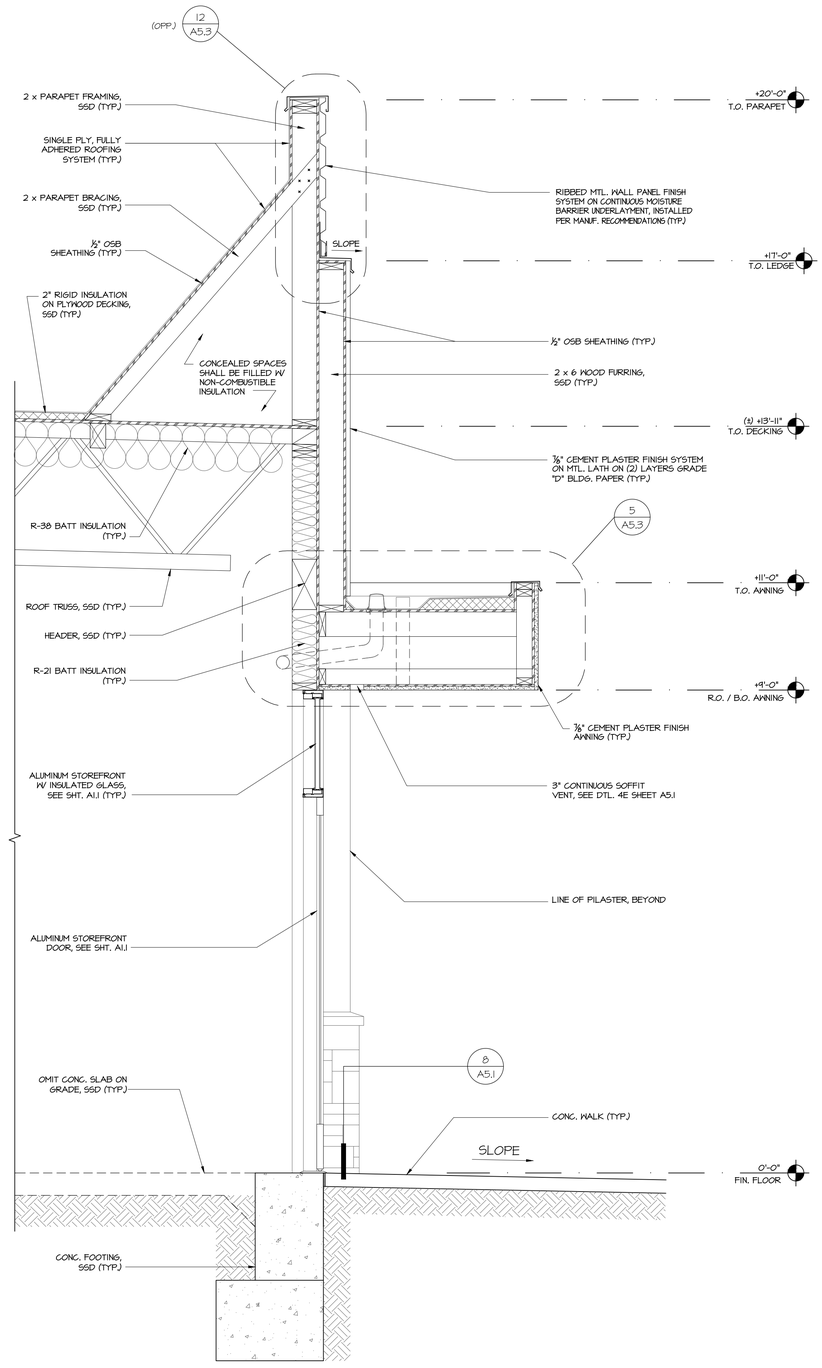
15 — 1 1/2"=1'-0"

2-HR. FIRE RATED PARAPET



19 — 3/4" = 1'-0"

2-HOUR FIRE RESISTANT WALL SECTION (UL #U371 & UL # 301)



17 — 3/4"=1'-0"

WALL SECTION - MAIN ENTRANCE

20 — -

NOT USED

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925-943-1581 Fax
925-878-9875 Cell
muthana@mlarchitect.com
www.mlarchitect.com

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PROPOSED RETAIL BUILDING
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REDWOOD CITY, CA 94063

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
04-24-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
2		
3		
4		
5		

WALL SECTIONS & DETAILS

PROJECT #: 18-10002

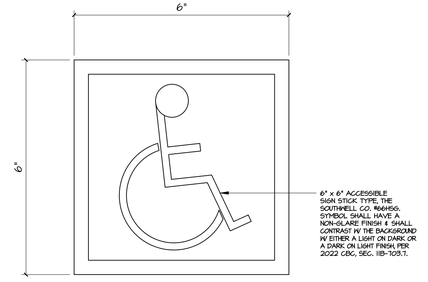
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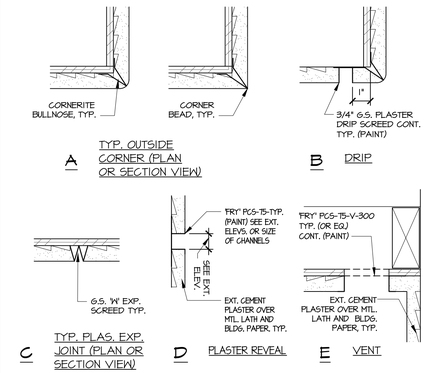
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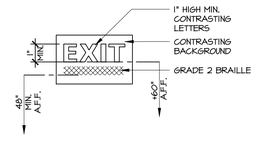
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5 N.T.S. ACCESSIBILITY SYMBOL

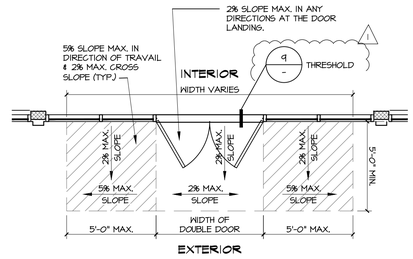


4 3" = 1'-0" SCREED DETAIL

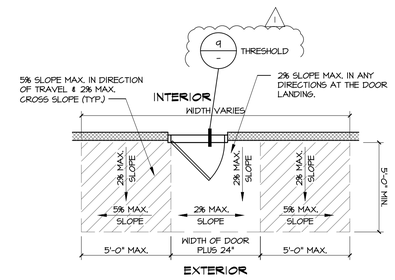


NOTE: ALL TACTILE EXIT SIGNAGE SHALL COMPLY W/ CBC 2022 SECTIONS 1011.4 AND 11B-703, AND ALL OTHER APPLICABLE CODES.

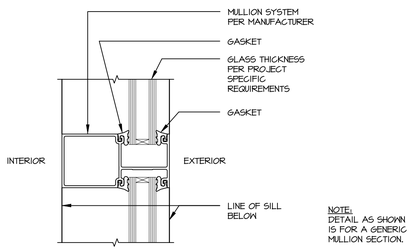
3 3" = 1'-0" TACTILE EXIT SIGN



2 1/4" = 1'-0" ACCESSIBLE ENTRANCE DOOR

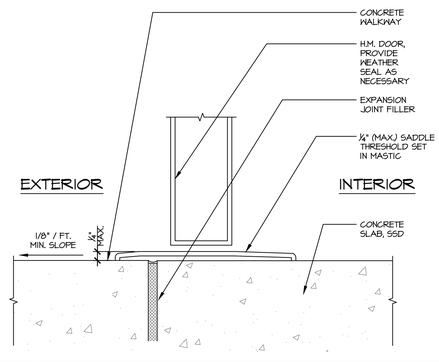


1 1/4" = 1'-0" ACCESSIBLE EXIT DOOR

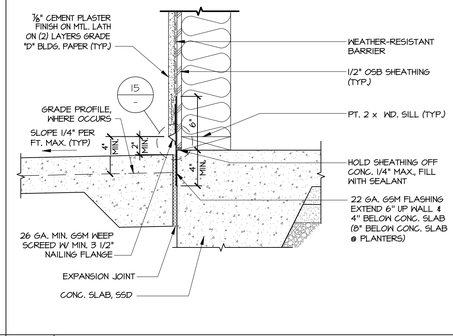


NOTE: DETAIL AS SHOWN IS FOR A GENERIC MULLION SECTION.

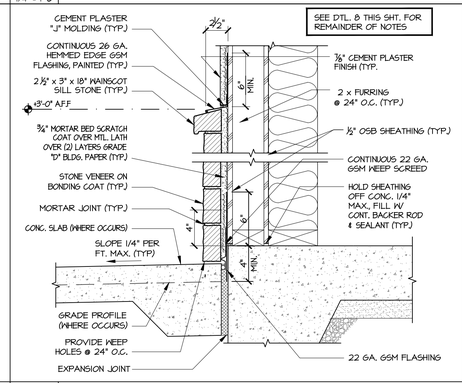
10 NONE VERTICAL / HORIZONTAL MULLION



9 3" = 1'-0" THRESHOLD

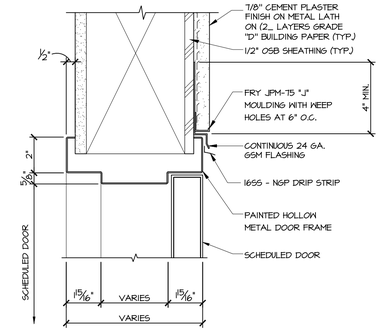


8 1 1/2" = 1'-0" EXTERIOR WALL SILL @ CEMENT PLASTER

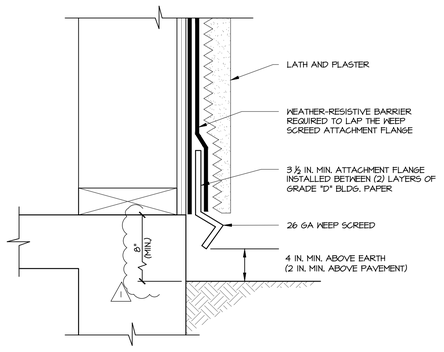


7 1 1/2"=1'-0" EXTERIOR WALL SILL @ STONE VENEER

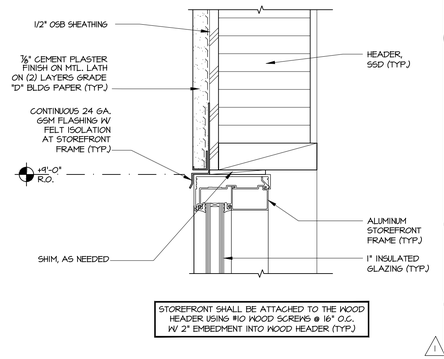
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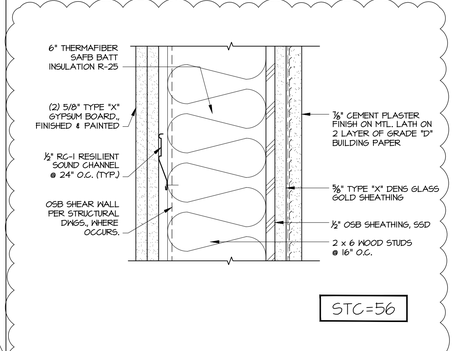
11 3" = 1'-0" EXTERIOR DOOR



15 NONE WEEP SCREED

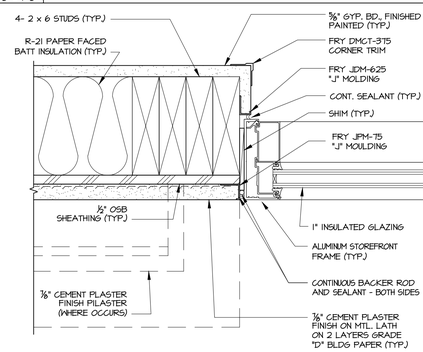


14 1 1/2"=1'-0" STOREFRONT HEAD



13 3" = 1'-0" 2-HR RATED WALL DTL. (EXTERIOR)

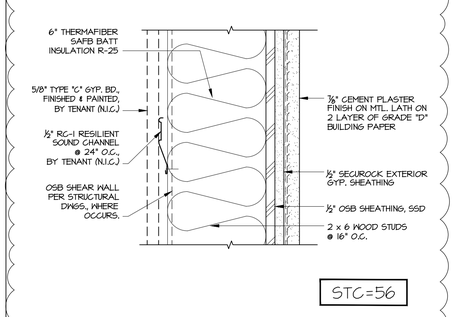
12 - NOT USED



11 3" = 1'-0" EXTERIOR DOOR

20 - NOT USED

19 3" = 1'-0" STOREFRONT SILL



18 3" = 1'-0" WALL DETAIL (EXTERIOR)

17 3" = 1'-0" WALL DETAIL (INTERIOR)

16 3" = 1'-0" STOREFRONT JAMB

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LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

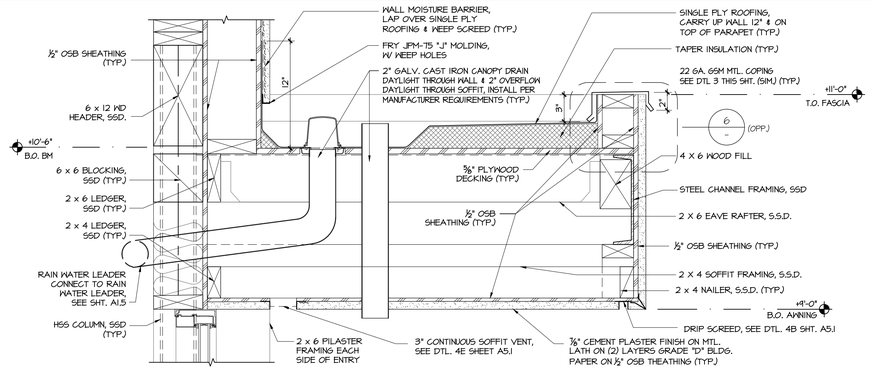
NO.	DATE	DESCRIPTION
-		ISSUED FOR CONSTRUCTION
-	04-24-23	ISSUED FOR PLAN CHECK
-	10-21-14	ISSUED FOR PLANNING
1	11-14-23	REVISED PER PLAN CHECK COMMENTS
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BUILDING DETAILS

PROJECT #: 18-10002
DRAWN: DP CHECKED: MII
SCALE: AS NOTED DATE: 04-18-23

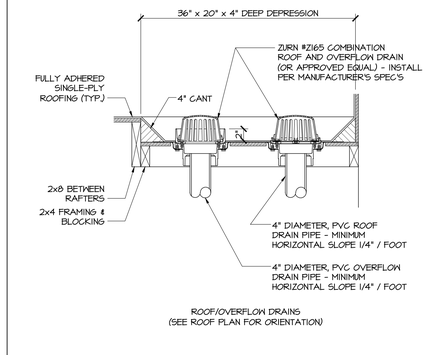
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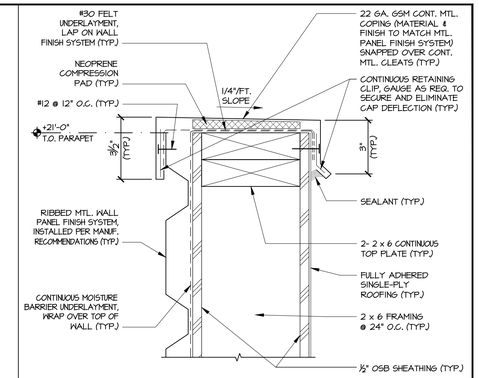


5 AWNING SECTION
1 1/2"=1'-0"

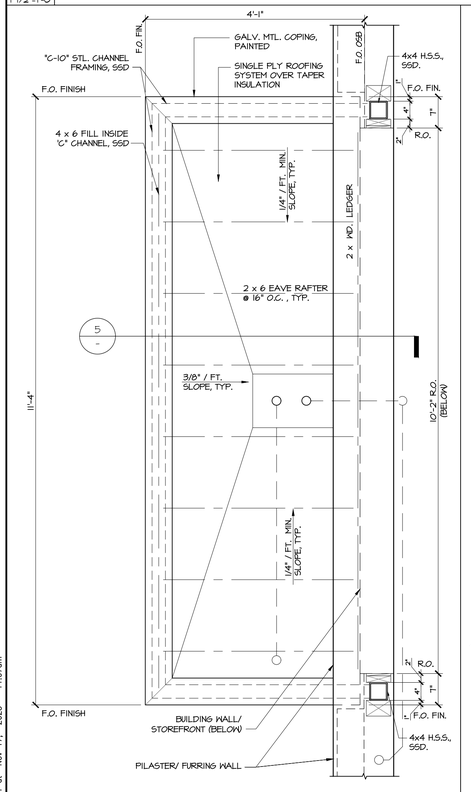
3 NOT USED
-



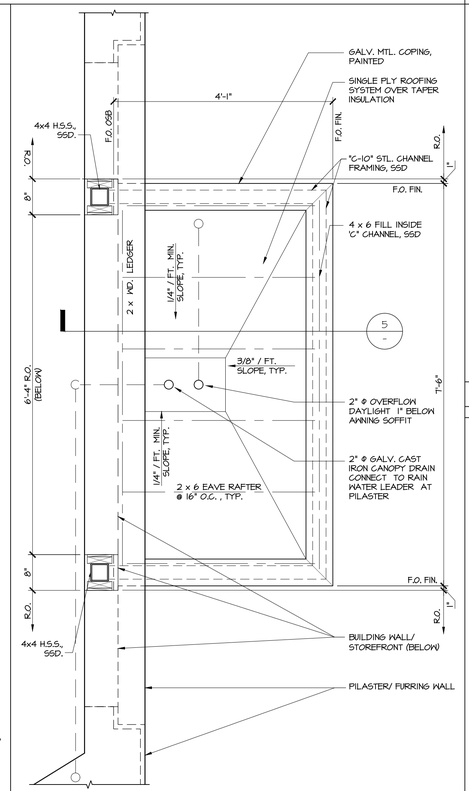
2 ROOF DRAIN & OVERFLOW
1" = 1'-0"



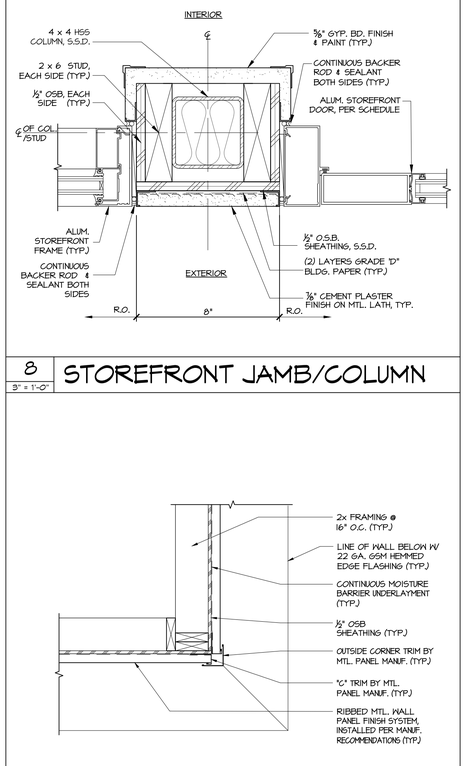
1 PARAPET CAP
3" = 1'-0"



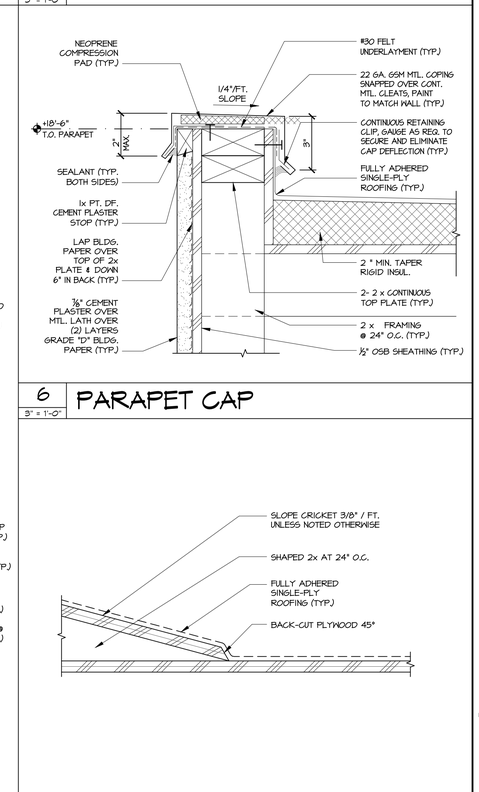
10 AWNING FRAMING PLAN
3/4"=1'-0"



9 AWNING FRAMING PLAN
3/4"=1'-0"

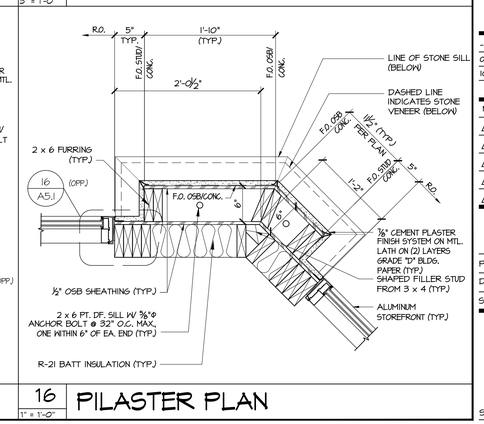


8 STOREFRONT JAMB/COLUMN
3" = 1'-0"

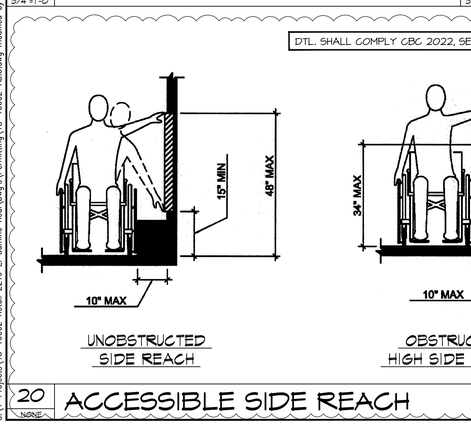


6 PARAPET CAP
3" = 1'-0"

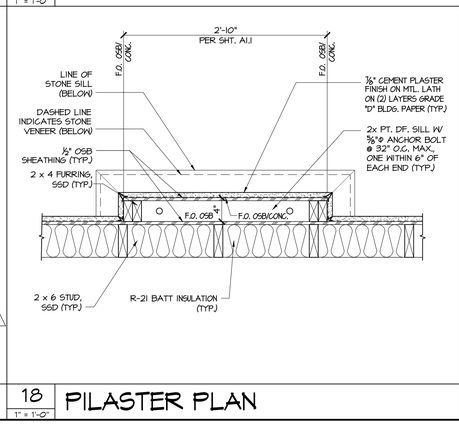
7 PILASTER PLAN
1" = 1'-0"



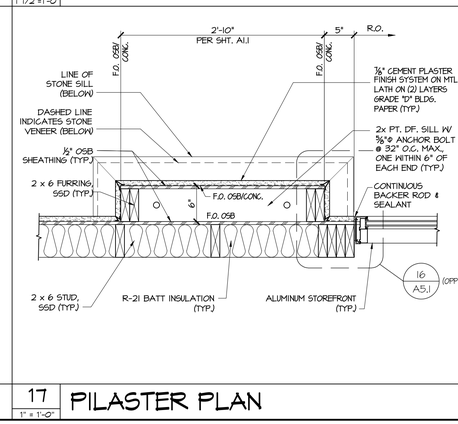
11 ROOF CRICKET
3" = 1'-0"



20 ACCESSIBLE SIDE REACH
NONE



18 PILASTER PLAN
1" = 1'-0"



17 PILASTER PLAN
1" = 1'-0"

16 PILASTER PLAN
1" = 1'-0"

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LICENSED ARCHITECT MUTHANA ISMAIL IBRAHIM C-29627 6/30/2025 RENEWAL DATE STATE OF CALIFORNIA

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04-24-23	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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BUILDING DETAILS

PROJECT #: 18-10002
DRAWN: DP CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

A5.3

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SECTION 033923 – MEMBRANE CONCRETE SEALERS

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Surface preparation.
B. Application of clear, water-based acrylic curing and sealing compound to horizontal concrete surfaces.
1.2 REFERENCES
A. ASTM C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
B. ASTM C 1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
C. AASHTO M 148 - Liquid Membrane Forming Compounds for Curing Concrete.
D. USDA - United States Department of Agriculture.
1.3 SUBMITTALS
A. Submit manufacturer's product data and application instructions.
1.4 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
B. Store materials in a clean, dry area in accordance with manufacturer's instructions.
C. Keep product from freezing.
D. Avoid direct contact with this product as it may cause mild-to-moderate irritation of the eyes and/or skin.
E. Protect materials during handling and application to prevent damage or contamination.
F. Do not mix any compound containing solvent.
G. Do not mix or agitate aggressively as foaming can occur.
1.5 ENVIRONMENTAL REQUIREMENTS
A. Do not apply product when air, surface, or material temperatures are expected to fall below 40o F (4o C) within four hours of expected application.
B. Do not apply to frozen concrete.
C. Do not use on dense or porous surfaces.

PART 2 - PRODUCTS
2.1 MANUFACTURER
A. W. R. MEADOWS, INC., PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976. (847) 683-4500. Fax (847) 683-4544. Website www.wrmeadows.com.
2.2 CONCRETE SEALERS
A. Products: Subject to compliance with requirements, provide the following, or approved equal:
1. VOCOMP-20 acrylic curing and sealing compound by W. R. MEADOWS.
2.3 PERFORMANCE REQUIREMENTS
A. Performance Requirements: Water-based acrylic curing and sealing compound shall be a non-yellowing, clear, acrylic curing and sealing compound meeting the following requirements:
1. ASTM C 309, Type 1, Class B
2. AASHTO M 148, Type 1, Class B
3. ASTM C 1315, Class A, Section 6.4.1 – non-yellowing
4. ASTM C 1315, Section 6.6 – exceed 50 MPa (70 psi) adhesion requirements

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine surfaces to receive curing and sealing compound. Notify architect if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.
3.2 SURFACE PREPARATION
A. Protect adjacent surfaces not designated to receive curing and sealing compound.
B. Clean and prepare surfaces to receive curing and sealing compound in accordance with manufacturer's instructions.
C. Ensure concrete surface is clean and dry, with all stains, oil, grease, dust, and dirt removed.
D. Concrete surface water should be dissipated when used on new concrete.
E. Concrete surfaces should not be marred by walking workers.
3.3 APPLICATION
A. Apply curing and sealing compound in accordance with manufacturer's instructions.
B. Ensure product is mixed for optimum performance. Avoid aggressive mixing as foaming may occur.
C. Use an industrial sprayer with a 5916 tip that produces a flow rate of 1/10 of one gallon per minute under 0.276 MPa (40 psi) of pressure.
D. Spray on in a fine, fog pattern, without spurts and dribbles, to form a thin, continuous film.
E. Alternatively apply using a lint-free roller or lamb's wool roller.
F. Avoid puddling in low areas.
3.4 PROTECTION
A. Restrict foot traffic for at least four hours; 12 hours is preferable.

END OF SECTION 033923

SECTION 047313 - MANUFACTURED STONE VENEER

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Portland cement based manufactured stone veneer and trim.
1.2 ACTION SUBMITTALS
A. Product Data: For each variety of manufactured stone, trim and accessory. Veneer manufacturer's installation instructions.
B. Samples:
1. Standard sample board consisting of small-scale pieces of veneer units showing full range of textures and colors.
2. Full range of mortar colors.
C. Verification Samples: Following initial sample selection submit "laid-up" sample board using the selected stone and mortar materials and showing the full range of colors expected in the finished Work; minimum sample size: 3 by 3 feet (1 by 1 m).
1.3 INFORMATIONAL SUBMITTALS
A. Maintenance Instructions.
B. Special Warranties.
1.4 QUALITY ASSURANCE
A. Qualifications:
1. Manufacturer Qualifications: Eldorado Stone, LLC.
2. Installer Qualifications: Experienced mason familiar with installation procedures and related local, state and federal codes masonry.
1.5 FIELD CONDITIONS
A. Environmental Requirements: When air temperature is 40 degrees F (4.5 degrees C) or below, consult local building code for Cold-Weather Construction requirements.
1.6 WARRANTY
A. Special Warranty: Manufacturer's standard warranty coverage against defects in materials when installed in accordance with manufacturer's installation instructions.

PART 2 - PRODUCTS
2.1 MANUFACTURED STONE VENEER
A. Provide manufactured stone veneer of variety, color range, finish, and other manufactured stone characteristics relating to aesthetic effects as indicated on Drawings.
2.2 MANUFACTURER
A. Eldorado Stone, LLC., Bldg. B, San Marcos, CA 92069
Tel: (800) 925-1491, 1370 Grand Ave
E-Mail: customerservice@eldoradostone.com
Website: www.eldoradostone.com:
2.3 MATERIALS
A. Manufactured Stone Veneer Product:
1. Products: Subject to compliance with requirements, provide the following, or as indicated on Drawings:
a. "Rustic Ledge", Color: Sequoia, or approved equal.
B. Accessories: Provide corners and other accessories required for a complete installation.
C. Veneer Unit properties: Manufactured stone veneer units consisting of portland cement, lightweight aggregates, and mineral oxide pigments.
1. Compressive Strength: ASTM C 192 and ASTM C 39, 5 sample average: greater than 1,800 psi (12.4MPa).
2. Shear Bond: ASTM C 482: 50 psi (345kPa), minimum.
3. Freeze-Thaw Test: ASTM C 67: Less than 3 percent weight loss and no disintegration.
4. Thermal Resistance: ASTM C 177: 0.473 at 1.387 inches thick
5. Weight per square foot: 2012 IBC and 2012 IRC, ASTM C1670, 15 pounds, saturated.
2.4 MORTAR MATERIALS
A. Mortar:
1. Cement: Portland cement complying with ASTM C 1329.
2. Lime: ASTM C 207.
3. Sand: ASTM C 144, natural or manufactured sand.
4. Color Pigment: ASTM C 979, mineral oxide pigments.
5. Water: Potable.
6. Pre-Packaged Latex-Portland Cement Mortar: ANSI A118.4
2.5 MORTAR MIXES
A. Standard Installation (Grouted Joints):
1. Mix mortar in accordance with ASTM C 270,
2. Polymer modified mortar complying with ANSI A118.4
a. Add color pigment in grout joint mortar in accordance with pigment manufacturer's instructions not to exceed 10% by weight of cement.
B. Or where indicated: Jointless/Dry-Stacked Installation:
1. Polymer modified mortar complying with ANSI A118.4
2. Mortar prepared to comply with ASTM C270. Type S mortar.
a. Add color pigment in accordance with pigment manufacturer's instructions.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine substrates upon which work will be installed.
B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.
C. Commencement of work by installer is acceptance of substrate.
3.2 PREPARATION
A. Protection: Protect adjacent work from contact with mortar.
B. Surface Preparation: Prepare substrate in accordance with manufacturer's installation instructions for the type of substrate being covered.
3.3 INSTALLATION
A. Install and clean manufactured stone veneer in accordance with manufacturer's installation instructions for Standard Installation (Grouted Joint) or Jointless/Dry-Stacked installation as specified above.
B. Apply repellent in accordance with repellent manufacturer's application instructions.
3.4 CLEANING
A. Remove protective coverings from adjacent work.
B. Cleaning Veneer Units:
1. Wash with soft bristle brush and water/granulated detergent solution
2. Rinse immediately with clean water
C. Removing Efflorescence:
1. Allow veneer to dry thoroughly
2. Scrub with soft bristle brush and clean water
3. Rinse immediately with clean water; allow to dry.

END OF SECTION 047313

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes, but is not limited to the following:
1. Miscellaneous steel framing and supports.
2. Shelf angles.
3. Metal ladders.
4. Ladder safety cages.
5. Steel Canopy and Corbel framing and supports.
6. Miscellaneous steel trim.
7. Metal guard posts (bollards).
1.2 ACTION SUBMITTALS
A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. Structural Performance of Aluminum Ladders: Aluminum ladders, including landings, shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
2.2 METALS
A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
B. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
C. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
D. Stainless-Steel Bars and Shapes: ASTM A 276, [Type 304] [Type 316L].
E. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
F. Rolled-Stainless-Steel Floor Plate: ASTM A 793.
G. Abrasive-Surface Floor Plate: Steel plate with abrasive granules rolled into surface or with abrasive material metallically bonded to steel.
H. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
I. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
J. Zinc-Coated Steel Wire Rope: ASTM A 741.
1. Wire-Rope Fittings: Hot-dip galvanized-steel connectors with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.
K. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
1. Size of Channels: [1-5/8 by 1-5/8 inches (41 by 41 mm)] [As indicated] <Insert size>.
2. Material: Galvanized steel, ASTM A 653/A 653M, [commercial steel, Type B] [structural steel, Grade 33 (Grade 230)], with G90 (Z275) coating; [0.108-inch (2.8-mm)] [0.079-inch (2-mm)] [0.064-inch (1.6-mm)] nominal thickness.
3. Material: Cold-rolled steel, ASTM A 1008/A 1008M, [commercial steel, Type B] [structural steel, Grade 33 (Grade 230)]; [0.0966-inch (2.5-mm)] [0.0677-inch (1.7-mm)] [0.0528-inch (1.35-mm)] minimum thickness; [unfinished] [coated with rust-inhibitive, baked-on, acrylic enamel] [hot-dip galvanized after fabrication].
L. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
M. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
N. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
2.3 FASTENERS
A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
1. Provide stainless-steel fasteners for fastening aluminum.
2. Provide stainless-steel fasteners for fastening stainless steel.
B. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.
C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy [Group 1 (A1)] [Group 2 (A4)] stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
D. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches (41 by 22 mm) by length indicated with anchor straps or studs not less than 3 inches (75 mm) long at not more than 8 inches (200 mm) o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B 633, Class Fe/Zn 5, as needed for fastening to inserts.
2.4 MISCELLANEOUS MATERIALS
A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting".
B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
E. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).
2.5 FABRICATION, GENERAL
A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.
B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.
C. Weld corners and seams continuously to comply with the following:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended.
D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Locate joints where least conspicuous.
E. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
F. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c.
2.6 MISCELLANEOUS FRAMING AND SUPPORTS
A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
C. Fabricate steel girders for wood frame construction from continuous steel shapes of sizes indicated.
1. Where wood nailers are attached to girders with bolts or lag screws, drill or punch holes at 24 inches (600 mm) o.c.
D. Fabricate steel pipe columns for supporting wood frame construction from steel pipe with steel baseplates and top plates as indicated. Drill or punch baseplates and top plates for anchor and connection bolts and weld to pipe with fillet welds all around. Make welds the same size as pipe wall thickness unless otherwise indicated.
2.7 METAL LADDERS
A. General:
1. Comply with ANSI A14.3.
B. Aluminum Ladders:
1. Space siderails 16 inches (406 mm)] [18 inches (457 mm)] apart unless otherwise indicated.
2. Siderails: Continuous extruded-aluminum channels or tubes, size as indicated on Drawings
3. Rungs: Extruded-aluminum tubes, size as indicated on Drawings
2.8 LADDER SAFETY CAGES
A. Fabricate ladder safety cages to comply with ANSI A14.3. Assemble by welding or with stainless-steel fasteners.
B. Provide primary hoops at tops and bottoms of cages and spaced not more than 20 feet (6 m) o.c. Provide secondary intermediate hoops spaced not more than 48 inches (1200 mm) o.c. between primary hoops.
2.9 MISCELLANEOUS STEEL TRIM
A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
C. Galvanize exterior miscellaneous steel trim or prime exterior miscellaneous steel trim with zinc-rich primer as indicated on Drawings.
2.10 METAL GUARD POSTS (BOLLARDS)
A. Fabricate metal bollards from steel shapes, as indicated on Drawings.
1. Cap bollards with 1/4-inch- (6.4-mm-) thick steel plate, or fill with concrete as indicated on Drawings.
B. Fabricate bollards with 3/8-inch- (9.5-mm-) thick steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch (19-mm) anchor bolts.
C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch- (6.4-mm-) thick steel plate welded to bottom of sleeve.
D. Prime bollards with zinc-rich primer.
2.11 FINISHES, GENERAL
A. Finish metal fabrications after assembly.
2.12 STEEL AND IRON FINISHES
A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
1. Shop prime with universal shop primer unless specified in Section 099113 "Exterior Painting" and/or Section 099123 "Interior Painting".
C. Preparation for Shop Priming: If indicated prepare surfaces to comply with requirements specified in Section 099113 "Exterior Painting" and/or Section 099123 "Interior Painting", otherwise prepare as indicated below:
1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
4. Other Items: SSPC-SP 3, "Power Tool Cleaning."

PART 3 - EXECUTION
3.1 INSTALLATION, GENERAL
A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
C. Field Welding: Comply with the following requirements:
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.
E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
3.2 INSTALLING METAL GUARD POSTS (BOLLARDS)
A. Install metal bollards by one of the methods listed below, as indicated on the Drawings.
1. Metal capped bollards: Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.
2. Anchor bollards to existing construction with anchor bolts where indicated. Provide four 3/4-inch (19-mm) bolts at each bollard unless otherwise indicated.
3. Anchor bollards in concrete with pipe sleeves preset and anchored into concrete, or in formed or core-drilled holes where indicated. Fill annular space around bollard solidly with nonshrink grout.
4. For bollards that do not have metal caps, fill bollards solidly with concrete, mounding top surface to shed water.
3.3 INSTALLING BEARING AND LEVELING PLATES
A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.
3.4 ADJUSTING AND CLEANING
A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055000

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Steel pipe and tube railings.
1.2 ACTION SUBMITTALS
A. Product Data: For the following:
1. Railing brackets.
2. Grout, anchoring cement, and paint products.
B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.
2. Infill of Guards:
a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.
2.2 METALS, GENERAL
A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
1. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.
2.3 STEEL AND IRON
A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
1. Provide galvanized finish for exterior installations and where indicated.
C. Plates, Shapes, and Bars: ASTM A 36/A 36M.
D. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
2.4 FASTENERS
A. General: Provide the following:
1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
B. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors]capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1)] [Group 2 (A4)] stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
2.5 MISCELLANEOUS MATERIALS
A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
E. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
F. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
G. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.
H. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.
I. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
J. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
2.6 FABRICATION
A. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
B. Form work true to line and level with accurate angles and surfaces.
C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
D. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
E. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
F. Form changes in direction by bending.
G. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
H. Close exposed ends of railing members with prefabricated end fittings.
I. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
J. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.
2.7 STEEL AND IRON FINISHES
A. Galvanized Railings:
1. Hot-dip galvanize exterior steel railings and interior steel railings where indicated, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
B. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning." or SSPC-SP 3, "Power Tool Cleaning."
D. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
1. Do not apply primer to galvanized surfaces.
E. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces unless other paint finish is scheduled. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.
1. Color: As indicated on Drawings or selected by Architect.

PART 3 - EXECUTION
3.1 INSTALLATION, GENERAL
A. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).
B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
3.2 ANCHORING POSTS
A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members.
3.3 ATTACHING RAILINGS AND POSTS
A. Attach railings and posts to wall and stair stringer with wall brackets and steel plates, as indicated on Drawings. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
B. Secure wall brackets and railing end flanges to building construction as indicated on Drawings.
3.4 ADJUSTING AND CLEANING
A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055213

SECTION 062013 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Exterior wood trim.
2. Exterior wood furring.
B. Related Requirements:
1. Section 074646 "Fiber Cement Siding" for Fiber Cement Siding and Trim.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of process and factory-fabricated product.
B. Samples: For each type of product involving selection of colors, profiles, or textures.
1.3 INFORMATIONAL SUBMITTALS
A. Compliance Certificates:
1. For lumber that is not marked with grade stamp.
2. For preservative-treated wood that is not marked with treatment-quality mark.
B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.

PART 2 - PRODUCTS
2.1 MATERIALS, GENERAL
A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated.
B. Factory mark each piece of lumber with grade stamp of inspection agency, indicating grade, species, moisture content at time of surfacing, and mill.
1. For exposed lumber, mark grade stamp on end or back of each piece, [or omit grade stamp and provide certificates of grade compliance issued by inspection agency].
C. Softwood Plywood: DOC PS 1.
D. Hardboard: ANSI A135.4.
2.2 WOOD-PRESERVATIVE-TREATED MATERIALS
A. Preservative Treatment by Pressure Process: AWPA U1; Use Category [UC3a] [UC3b].
1. Kiln dry lumber and plywood after treatment to a maximum moisture content of 19 and 18 percent, respectively.
2. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
3. Application: Where indicated.
2.3 EXTERIOR TRIM
A. Lumber Trim:
1. Species and Grade: Redwood, Clear, unless indicated otherwise; RIS.
2. Species and Grade: Western red cedar, Clear Heart or Grade A, NLGA, WCLIB, or WWPA.
3. Maximum Moisture Content: 19 percent.
4. Face Surface: Surfaced (smooth) or Saw textured as indicated.
B. Moldings for: MMPA WM 4, N-grade or P-grade wood moldings, without finger jointing. Made from kiln-dried stock to patterns included in MMPA's "WM/Series Wood Moulding Patterns."
1. Species: Redwood or Western red cedar as indicated.
2.4 EXTERIOR TRELLISES
A. Lumber and Trim:
1. Species and Grade: Redwood, Clear, unless indicated otherwise; RIS.
2. Species and Grade: Western red cedar, Clear Heart or Grade A, NLGA, WCLIB, or WWPA.
3. Maximum Moisture Content: 19 percent.
4. Face Surface: Surfaced (smooth) or Saw textured as indicated.
2.5 LUMBER SOFFITS
A. Provide kiln-dried lumber siding complying with DOC PS 20, factory coated with exterior primer compatible with topcoats specified.
B. Species and Grade: Grade A western red cedar; NLGA, WCLIB, or WWPA, unless indicated otherwise.
C. Pattern: As indicated
2.6 PLYWOOD SOFFITS
A. Plywood Type: Exterior, Grade A-C or Grade B-C] plugged and touch sanded.
B. Thickness: As indicated.
C. Face Species: As indicated.
D. Pattern: As indicated.
E. Surface: Smooth or Rough sawn as indicated.
2.7 MISCELLANEOUS MATERIALS
A. Fasteners for Exterior Finish Carpentry: Provide nails or screws, in sufficient length to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.
1. For face-fastening siding, provide ringed-shank siding nails or hot-dip galvanized-steel siding nails unless otherwise indicated.
2. For applications not otherwise indicated, provide stainless-steel or hot-dip galvanized-steel fasteners.
B. Flashing: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim" for flashing materials installed in exterior finish carpentry.
C. Sealants: Latex, complying with ASTM C 834 Type OP, Grade NF and applicable requirements in Section 079200 "Joint Sealants" and recommended by sealant and substrate manufacturers for intended application.

PART 3 - EXECUTION
3.1 PREPARATION
A. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099113 "Exterior Painting."
3.2 INSTALLATION, GENERAL
A. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Install stairs with no more than 3/16-inch (4.7-mm) variation between adjacent treads and risers and with no more than 3/8-inch (9.5-mm) variation between largest and smallest treads and risers within each flight.
3.3 STANDING AND RUNNING TRIM INSTALLATION
A. Install flat-grain lumber with bark side exposed to weather.
B. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary.
1. Use scarf joints for end-to-end joints.
2. Stagger end joints in adjacent and related members.
C. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints, with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

END OF SECTION 062013

SECTION 071900 - WATER REPELLENTS

PART 1 - GENERAL
1.1 SUMMARY
A. Section includes penetrating water-repellent treatments for the following vertical surfaces:
1. Vertical cast-in-place concrete and other masonry surfaces as indicated.
1.2 PERFORMANCE REQUIREMENTS
A. Performance Testing: Provide water repellents that comply with test-performance requirements
indicated, as evidenced by reports of tests performed by manufacturer by a qualified independent testing agency on manufacturer's standard products applied to substrates simulating
those on Project using same application methods to be used for Project.
B. Absorption: Minimum 90 percent reduction of absorption after 24 hours in comparison of
treated and untreated specimens.
1. Hardened Concrete: ASTM C 642.
C. Water-Vapor Transmission: Maximum 10 percent reduction in rate of vapor transmission in
comparison of treated and untreated specimens, according to ASTM E 96.
D. Durability: Maximum 5 percent loss of water repellency after 2500 hours of weathering in
comparison to specimens before weathering, according to ASTM G 154.
1.3 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.
1. Include manufacturer's printed statement of VOC content.
B. Samples: For each type of water repellent and substrate indicated, 12 by 12 inches in size, with
specified water-repellent treatment applied to half of each Sample.
1.4 QUALITY ASSURANCE
A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.
1.5 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in Part 1 Performance Requirements Article within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS
2.1 MANUFACTURERS
A. Products: Subject to compliance with requirements, provide one of the following products or approved equal:
1. Enviroseal 7 or Enviroseal Double 7 H.D.; Hydrozo, A Division of ChemRex, Shakopee,
MN (800) 433-9517; www.chemrex.com.
2. OKON W-I or W-2; Dunn-Edwards Corporation, Los Angeles, CA
(323) 771-3330; www.dunnedwards.com.
3. Weatherseal 201-GP; ProSoCo, Inc., Kansas City, KS
(800) 255-4255; www.prosoco.com.
4. Acryseal WD; Rainproof Systems, Commerce, CA
(323) 887-8761.
B. Silane, Penetrating Water Repellent,: Clear, containing solids of alkyltrialkoxysilanes; with alcohol, mineral spirits, water, or other proprietary solvent carrier; and with VOC levels complying with CA Green Building Standards and requirements of local jurisdiction.
C. Siloxane, Penetrating Water Repellent: Clear, containing solids of oligomerous alkylalkoxysiloxanes; with alcohol, ethanol, mineral spirits, water, or other proprietary solvent carrier; and with VOC levels and with VOC levels complying with CA Green Building Standards and requirements of local jurisdiction.
D. Silane/Siloxane-Blend, Penetrating Water Repellent: Clear, silane and siloxane blend with VOC levels complying with CA Green Building Standards and requirements of local jurisdiction.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.
1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in representative locations by method recommended by manufacturer.
2. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
3. Verify that required repairs are complete, cured, and dry before applying water repellent.
B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.
3.2 PREPARATION
A. New Construction and Repairs: Allow concrete and other cementitious materials to age before application of water repellent, according to repellent manufacturer's written instructions.
B. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions.
C. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.
D. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.
3.3 APPLICATION
A. Apply coating of water repellent on surfaces indicated to be treated using low-pressure spray to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.
B. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.
3.4 CLEANING
A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application.
B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 071900

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Glass-fiber blanket.
B. Related Sections:
1. Section 075423 – Thermoplastic Polyolefin (TPO) Roofing. For board insulation installed under roofing.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
1.3 INFORMATIONAL SUBMITTALS
A. Product Data: For each type of product indicated.
1.4 DELIVERY, STORAGE, AND HANDLING
A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS
2.1 GLASS-FIBER BLANKET
A. Glass-Fiber Blanket, Unfaced: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Johns Manville; a Berkshire Hathaway company.
b. Owens Corning.
2. Thickness: R-value and thickness as indicated on Drawings.
B. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Johns Manville; a Berkshire Hathaway company.
b. Owens Corning.
2. Thickness: R-value and thickness as indicated on Drawings.
C. Sustainability Requirements: Provide glass-fiber blanket insulation complying with CA Green Building Standards and requirements of local jurisdiction.
1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde, or as required by CA Green Building Standards requirements
2.2 ACCESSORIES
A. Insulation for Miscellaneous Voids:
1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.

PART 3 - EXECUTION
3.1 INSTALLATION, GENERAL
A. Comply with insulation manufacturer's written instructions applicable to products and applications.
B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.
3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION
A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
6. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

END OF SECTION 072100

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Building paper.
2. Building wrap.
3. Flexible flashing.
1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.

PART 2 - PRODUCTS
2.1 WATER-RESISTIVE BARRIER
A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.
B. Building Paper: Water-vapor-permeable, asphalt-saturated kraft building paper that complies with ICC-ES AC38, Grade D; except with water-resistance rating not less than 1 hour.
C. Building Wrap: ASTM E 1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.
D. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.
2.2 FLEXIBLE FLASHING
A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch (0.8 mm).
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. DuPont Building Innovations: E. I. du Pont de Nemours and Company; DuPont Flashing Tape.
b. GCP Applied Technologies Inc. (formerly Grace Construction Products); Vycor Butyl Self Adhered Flashing.
2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.
B. Rubberized-Asphalt Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.030 inch (0.8 mm).
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
a. Fortifiber Building Systems Group; Fortiflash 25, Fortiflash 40.
b. GCP Applied Technologies Inc. (formerly Grace Construction Products); Vycor V40 Self-Adhered Flashing.
2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

PART 3 - EXECUTION
3.1 WATER-RESISTIVE BARRIER INSTALLATION
A. Cover sheathing with water-resistive barrier as follows:
1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
2. Apply barrier to cover vertical flashing with a minimum 6 inch (100-mm) overlap unless otherwise indicated.
B. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.
3.2 FLEXIBLE FLASHING INSTALLATION
A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
1. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
2. Lap flashing over water-resistive barrier at bottom and sides of openings.
3. Lap water-resistive barrier over flashing at heads of openings.

END OF SECTION 072500

SECTION 073216 - CONCRETE ROOF TILES

PART 1 - GENERAL
1.1 SUMMARY
A. Section Includes:
1. Concrete tile roofing and accessories.
2. Underlayment.
1.2 REFERENCES
A. ASTM International (ASTM):
1. ASTM C 1492 - Standard Specification for Concrete Roof Tile.
2. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 1997a.
B. FRSA/TRI - Concrete and Clay Roof Tile Installation Manual Fourth Edition (For Outside HVHZ Wind Zones).
C. ICC ESR 1900 (ICC-ES) International Code Council Evaluation Services.
D. ICC ESR 2015P Concrete and Clay Roof Tile Installation Manual for Moderate Climate Regions.
E. ICC AC 180 - Acceptance Criteria for Clay and Concrete Roof Tiles. August 2007.
F. ICC ER ESR 1787 Flex Seal, Flex Flash, Flex Vent.
1.3 DESIGN REQUIREMENTS
A. Roofing tile materials and installation shall conform to the requirements of the Applicable Building Codes and local jurisdictions.
1.4 ACTION SUBMITTALS
A. Product Data: Manufacturer's data for each product to be used including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
B. Shop Drawings: Indicate metal flashing profiles, joint locations, fastening locations and installation details. Indicate tile layout with location of cut and special shaped tiles identified.
C. Samples: For each exposed product and for each color and texture specified.
1.5 INFORMATIONAL SUBMITTALS
A. Material test reports for concrete roof tiles.
B. Evaluation reports for the following:
1. Concrete roof tiles, fasteners, and attachment systems.
C. Sustainable Design Submittals:
1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.
D. Warranties: Sample of special warranties.
1.6 ASSURANCE
A. Manufacturer Qualifications: Member of the Tile Roofing Institute.
B. Installer Qualifications: License by the local/state authority, and have the proper insurance to operate in your area.
C. Installation: Refer to the Tile Roofing Institute Installation Manual for Moderate Climate Regions ICC-ES ESR 2015P, FRSA/TRI Concrete and Clay Roof Tile Installation Manual Fourth Edition 07-320-8-05 ICC-SSTD-11 or TAS 101 and RAS 118,119,120 for High Wind Zones (HVHZ).
D. Product Requirements:
1. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years.
1.7 DELIVERY, STORAGE, AND HANDLING
A. Deliver, handle, and store materials in accordance with manufacturer's instructions.
1. Refer to the FRSA TRI 07320/8-05 Concrete and Clay Roof Tile Installation Manual Fourth Edition section #1.04.
2. Refer to roof loading guide MC-09 of the Tile Roofing Institute Installation Manual for Moderate Climate Regions ICC-ES ESR 2015P.
B. Store products in manufacturer's unopened packaging until ready for installation.
C. Maintain dry storage area for products of this section until installation of products.
1.8 PROJECT CONDITIONS
A. Anticipate environmental conditions (temperature, humidity, and ventilation) to schedule work within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
1.9 WARRANTY
A. Manufacturer shall warrant the products against manufacturing defects and shall include material and labor to repair or replace defective materials as specified in manufacturer's warranty.
1. Warranty Period - Concrete Roof Tile: 20 year labor and material Warranty for concrete roof tile and installation.
2. Warranty Period - Concrete Roof Tile: Lifetime Transferable Limited Product Warranty for concrete roof tile.

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. Exterior Fire-Test Exposure: Provide concrete roof tiles and related roofing materials identical to those of assemblies tested for Class A, fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories, Inc. or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
B. Comply with the requirements of the current edition of the California Green Building Standards Code – Nonresidential.
C. Solar Reflectance Index (SRI): Comply with California Green Building Standards Code – Nonresidential, Tier 1 requirements for three-year-aged SRI and initial SRI when calculated according to ASTM E 1980, based on testing identical products by a qualified testing agency.
2.2 CONCRETE ROOF TILES
A. Concrete Roof Tiles: ASTM C 1492, molded- or extruded-concrete roof tile units of shape and configuration indicated, with integral color, and free of surface imperfections. Provide with fastening holes prepunched at factory.
1. Basis-of-Design Product: Subject to compliance with requirements, provide the following product or approved equal.
2. Manufacturer: Eagle Roofing Products - Stockton: 4555 S. McKinley, Stockton, CA 95206. ASD. Tel: (800) 998-3245. Fax: (209) 234-4366. Website: www.eagleroofing.com.
a. Profile: "Capistrano High Profile Tile".
b. Weight: Lightweight
c. Product Name: "Capistrano".
d. Cool Roof Color / Number: 3118, "Terracotta Gold", Terracotta Gold Flashed.
e. Trim Tile: Barrel type.
f. Trim Tile Color: to match field tile.
g. Hip Starters: Barrel.
h. Hip Starters Color: to match field tile.

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6/30/2025
RENEWAL DATE

- ISSUED FOR CONSTRUCTION
- ISSUED FOR PLAN CHECK
10-21-14 ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

SP.1

SHEET OF

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2.3 UNDERLAYMENT MATERIALS

A. Felt Underlayment: Type II, asphalt-saturated organic felt, commonly called No. 30 or 30#, conforming to: ASTM D 226/D 226M.

2.4 RELATED MATERIALS

A. Eagle Energy Saving Roof:

1. Eave Ventilation: Eagle Roofing Products, Ventilated Bird Stop/Eave Riser.

2. Bird Stop for High Profile Tiles: Color as selected by Architect.

3. The Riser for Raised/Elevated Battens: Eagle Roofing Products, The Riser.

4. Batten Type: 1 by 2 inch (25 by 50 mm) wood, or as indicated on Drawings.

B. Decking: Comply with FRSA/TRI 07320/8.05 Concrete and Clay Tile Installation Manual for Moderate Climate.

C. Underlayment: Comply with FRSA/TRI Manual Fourth Edition 07320/8-05, Concrete and Clay Tile Installation for Moderate Climate.

D. Battens:

1. Nominal 1 inch by 2 inches (25 mm by 51 mm) complying with IBC Chapter 23, section 2302.

2. Comply with Section #3.11 pages #16-#17 and #82 of the FRSA/TRI 07320/8-05 Concrete and Clay Roof Tile Installation Manual Fourth Edition.

3. The Riser as manufactured for Eagle Roofing Products, Product Elevating battens off of the roof deck.

4. The Scalloped Batten as manufactured by Eagle Roofing Products. Product for elevating battens off of the roof deck.

E. Eave Closure/Riser/Bird Stop: Comply with MC 10, MC-10A, 10B, 10C & or 10D (Tile Roofing Institute Moderate Climate Installation Guide ICC-ES ESR 2015P). Refer to drawings.

1. Bird Stop for High Profile Tiles: Color: as selected by Architect.

F. Eave Closure/Riser/Bird Stop:

1. Comply with Section # 2.09 and #2.10 (FRSA TRI 07320/8-05 Fourth Edition installation Guide ICC-ES ESR 2015P). Refer to drawings.

G. Eagle Roofing Products Bird Stop Capistrano/High Profile: Color: as selected by Architect

H. Rake and Ridge Flashing: Flashing shall be a minimum No. 26 gage Galvanized steel G90 or equal.

1. Raised Metal Rake Trim for All Profiles, 1-1/2 inches (38 mm): Color: as selected by Architect.

2. Ridge Weather Block for High Profile Tiles: Color: as selected by Architect.

I. Rake/Gable Finish:

1. Rake Gable Tile:

a. Install first rake tile the exposed length of first course of field tile with factory finish of rake tile towards the eave.

b. Fasten rake tile with a minimum two 10D nails and /or of sufficient length to penetrate the framing a minimum of 3/4 inch (19 mm).

c. About each succeeding rake tile to the nose of the field tile above and maintain a constant head lap.

2. Mortar Finish:

a. Place mortar bed along roof edge.

b. Point smooth to a straight edge finish.

J. Valley Flashings:

1. No. 26 Gauge (G90) Galvanized 24 inches (610 mm) Flashing.

2. Comply with Tile Roofing Institute Moderate Climate Installation Guide MC 12B.

3. Comply with FRSA/TRI 07320/8-05 Fourth Edition Installation Guide.

K. Wall Trays (Pans) Flashing:

1. No. 26 Gauge (G90) Galvanized minimum 6 inches (152 mm) trough.

2. Comply with Tile Roofing Institute Moderate Climate Installation Guide MC 12B.

3. Comply with FRSA/TRI 07320/8-08 Fourth Edition Installation Guide.

L. Roof to Wall Flashing: No. 26 Gauge (G90) Galvanized or flexible flashing to provide minimum 3 inches (76 mm) coverage.

M. Pipe Flashing:

1. No. 26 Gauge (G90) Galvanized deck flashing installed with underlayment.

2. High/Low profile tile flashing - 2-1/2 lb. lead, dead soft aluminum or copper.

N. Tile Fasteners:

1. Corrosive resistant fastener meeting ASTM A641 Class I or approved equal. Number 11 gauge diameter and of sufficient length to penetrate 3/4 inch (19 mm) into or through the thickness of the deck or the batten. Comply with Tile Roofing Institute Moderate Climate Installation Guide Table 1A and 1B.

2. Comply with FRSA/TRI 07320/8-05 Fourth Edition Installation Guide.

3. Screw Fasteners:

a. Corrosion resistant meeting ASTM A641 Class 1 and/or corrosion resistance equal (according to ASTM B 117). Screws shall be 2-1/2 inches (64 mm) in length or penetrate a minimum 3/4 inch (19 mm) into the deck or batten. ASTM A641 Class 1 is a nail specification that can be converted to screw fasteners through performance testing (ASTM B 117). Each fastener manufacturer is responsible for supplying this support this data. Minimum #8 course thread.

4. Special Application: Boosted Capistrano Installations.

a. Wire Ties: Bronze.

b. Wire Ties: Stainless Steel.

O. Adhesive/Sealant: Tile adhesive formulated for use with concrete roof tile.

P. Ventilation: Per local building code requirement.

2.5 METAL FLASHING AND TRIM

A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Sheet Metal: Stainless steel, Zinc-tin alloy-coated stainless steel, Zinc-tin alloy-coated steel, Aluminum, mill finished.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for design, dimensions, metal, and other characteristics of the item.

C. Vent-Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches (102 mm) from pipe onto roof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive tile to verify conditions. Do not commence tile installation until unsatisfactory conditions are corrected.

3.2 TILE INSTALLATION

A. Install in accordance with manufacturer's instructions and the following standards as applicable to the location of the project:

1. Tile Roofing Institute Moderate Climate Installation Guide ICC-ES ESR 2015P (TRI Guide).

B. Roof Layout: Layout according to TRI Guide MC 07, MC 08, MC 08A, MC 09. Roof Layout: Layout according to FRSA/TRI 07320/8-05 Fourth Edition. Refer to section # (3.08, 3.12).

C. Battens: Install according to TRI Guide Table 1, Table 2, Table 3, MC 04 or MC-05, MC 06, MC 06A. FRSA/TRI 073020/8-05 Fourth Edition. Refer to section #3.11 pages 16-17 and 82.

D. Underlayment: Install according to TRI Guide MC 01A, MC 01B and manufacturer's instructions. FRSA/TRI 07320/8-05 Fourth Edition. Quick Reference charts on pages 2, 23, 45, 67 and manufacturer's instructions.

E. Vent Pipes: Install according to TRI Guide MC 02. FRSA/TRI Fourth Edition. See drawings 11,12,12,14 and 11-b, 12-b, and 14-b.

F. Eave/Gable: Install according to MC 10, MC 10A, MC 10B, MC 20, MC 20A. FRSA/TRI 07320/8-05 Fourth Edition. Refer to section 3.03 for eave and refer to sections 3.05, 3.15 and 4.09 for gable.

G. Venting: Install according to TRI Guide MC 21, manufacturer's instructions and local code requirements.

H. Hip and Ridge: Install according to TRI Guide MC 18, MC 18A, MC 18B. FRSA/TRI 07320/8-05 Fourth Edition.

I. Rake: Install according to TRI Guide MC 19, MC 19A, MC 19B. FRSA/TRI 07320/8-05 Fourth Edition, refer to sections 4.09, 3.14 and 3.18.

J. Valleys: Install according to TRI Guide MC 03, MC 03A, MC 17, MC 17A, MC 17B, MC 17C, MC 17D. FRSA/TRI 07320/8-05 Fourth Edition, refer to sections 3.05 and 3.04 drawings 3, 4, 5 and 3b, 4b, 5b.

K. Side Wall Flashing: Install according to TRI Guide MC 12, MC 12A, MC 13, MC 13A. FRSA/TRI 07320/8-05 Fourth Edition drawing 7.

L. Head and Apron Flashing: Install according to TRI Guide MC 11, MC 11A. FRSA/TRI 07320/8-05 Fourth Edition drawings 8, 9, and 10.

M. Skylights: Install according to TRI Guide MC 16, MC 16A, MC 16B. Gutters: Install according to TRI Guide MC 23.

3.3 CLEAN-UP

A. Remove all debris, including any cut dust, from roof daily.

3.4 REPAIR AND REPLACEMENT

A. Comply with requirements of TRI Guide MC 24.

3.5 PROTECTION

A. Protect material and take precautions to prevent other trades from damaging roof materials during and after installation.

END OF SECTION 073216

SECTION 074113 - BATTEN-SEAM METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes batten-seam metal roof panels and related accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with Solar Reflectance Index requirements.

C. Shop Drawings: Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.

D. Samples: For each type of metal panel indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Warranties: Samples of special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard Full System Weathertightness Warranty form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Energy Performance: General: Provide roof panels that comply with requirements of current version of California Green Building Standards Code – Nonresidential and local jurisdiction.

B. Provide roof panels complying with the requirements of the current edition of the California Green Building Standards Code – Nonresidential, Tier 1.

1. Three-year, aged solar reflectance of not less than 0.20 and emissivity of not less than 0.75 when tested according to CRRC-1.

C. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

2. Other Design Loads: As indicated on Drawings.

3. Deflection Limits: For wind loads, no greater than 1/180 of the span.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 BATTEN-SEAM METAL ROOF PANELS

A. General: Provide factory-formed metal roof panel assembly designed to be installed by covering vertical side edges of adjacent panels with battens and mechanically attaching panels to supports using concealed clips. Include battens and accessories required for weathertight installation.

B. Narrow-Profile, Snap-on-Batten-Seam Metal Roof Panels: Formed with vertical ribs at panel edges and a flat pan between ribs; designed for independent installation by mechanically attaching panels to supports using concealed clips located under one side of panels, engaging the opposite edge of adjacent panels, and installing 3/8- to 1/2-inch-(10- to 13-mm-) wide, snap-on battens over panel joints.

1. Manufacturers: Subject to compliance with requirements, the following product or approved equal:

a. AEP Span; A Division of ASC Profiles, Inc., Select Seam Narrow Batten, or approved equal.

2. Metallic-Coated Steel Sheet: aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 22 Gauge: Yield Strength 50,000 psi; with aluminum-zinc alloy coating conforming to ASTM A792, Class AZ50.

b. Exterior Finish: DuraTech® 5000: Polyvinylidine Fluoride, full 70 percent Kynar 500®or Hylar 5000®, consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 8 to 15 when tested in accordance with ASTM D523 at 60 degrees.

c. Color: As indicated on Drawings.

3. Panel Width and Pattern: As indicated on Drawings

a. 12-inch panel width, 16-inch panel width, or 21 ¼-in panel width.

b. Flat pan.

4. Panel Rib Height:

a. Narrow batten cap 1-inch high x 3/8-inch wide, unless indicated otherwise on Drawings.

5. Batten Material: Same material, finish, and color as roof panels.

6. Clips: One-piece fixed or Two-piece floating to accommodate thermal movement.

a. Material: 0.028-inch- (0.71-mm-) nominal thickness, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet.

7. Panel Coverage: As indicated on Drawings.

8. Batten Height: 1.0 inch (25 mm), unless indicated otherwise on Drawings.

9. Seam Sealant: Factory apply high-grade butyl mastic sealant within the confines of narrow batten, designed to seal against adjacent male panel legs.

2.3 UNDERLAYMENT MATERIALS

A. Felt Underlayment: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felts.

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.4 CLIPS AND FASTENERS

A. Bearing Plate: 22ga minimum See Metal Construction Association Technical Bulletin "Fastener Selection". Usually retain first option; retain second option if UL Class 90 is required.

B. Fasteners: As recommended by manufacturer for performance indicated

2.5 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645; cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal panels.

2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Trims and Flashings: Material, metal thickness, and finish to match panels. Profiles indicated in Drawings.

1. Provide manufacturer's standard accessories and other items essential to completeness of standing seam roof installation.

D. Panel Penetration Flashings: As recommended by panel manufacturer; designed to provide sufficient movement to prevent creation of points of fixity at penetrations.

E. Gutters and Downspouts: Formed from same material as roof panels according to SMACNA's "Architectural Sheet Metal Manual." Finish to match metal roof panels or roof fascia and rake trim as indicated on Drawings.

F. Sealant for Field Application: high grade non-curing butyl or curing urethane sealants as recommended by panel manufacturer that are compatible with panel materials, are non-staining, and do not damage panel finish

2.6 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements. Panels shall be factory correctively-leveled.

1. Unless otherwise shown on Drawings or specified herein, fabricate panels in continuous lengths and fabricate flashings and accessories in longest practical lengths. Contact AEP Span if panel lengths required over 60 feet.

B. Panels:

1. Provide panels in full length from ridge to eave when possible.

2. Where single length panels are not practical, provide mated swaged panels for positive joint end laps, shingled to accommodate water run-off (fabricated with overlap in direction of water flow).

3. Roof panels shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations which create voids and requiring supplemental closure devices shall not be considered acceptable.

4. Engineer panels to use concealed anchors that permit expansion and contraction, except at eaves, end laps, ridges, valleys, hips and gables.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.7 FINISHES

A. Panels and Accessories:

1. Panel Finish: Provide primer and top finish coat on exposed faces; provide primer and manufacturer's standard backer coat on concealed faces of panels.

2. Exterior Finish: DuraTech® 5000: Polyvinylidine Fluoride, full 70 percent Kynar 500®or Hylar 5000®, consisting of a baked-on 0.15-0.20 mil corrosion resistant primer and a baked-on 0.70-0.80 mil finish coat with a specular gloss of 8 to 15 when tested in accordance with ASTM D523 at 60 degrees.

3. Color: "Regal White", or as indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: With Installer present.

1. Examine conditions and substrates on which metal panels are to be installed. Structural support or substrate shall be flat and plumb to avoid panel stresses and distortion.

2. Prior to starting work, correct defects.

B. Field Measurements:

1. Coordinate field measurements and fabrication schedule with construction progress.

2. Field measure prior to fabrication. Show recorded dimensions on shop drawings, including locations of shop-fabricated openings.

3. If field measurements differ from drawing dimensions, notify Architect prior to fabrication.

C. Substrate Tolerances: Deviations from flat plane shall not exceed the following.

1. 1/4 inch in 20 feet.

2. 1/2 inch across building elevation.

3. 1/8 inch in 5 feet.

3.2 PREPARATION

A. Substrate and Underlayment: Install according to approved shop drawings and metal panel manufacturer's recommendations.

3.3 INSTALLATION

A. Panels and Trim: Comply with manufacturer's instructions for assembly, installation and erection for weather tight installation.

1. Install according to approved shop drawings.

2. Install panels in accordance with manufacturer's instructions and recommendations. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria.

3. Comply with methods and recommendations of SMACNA Architectural Sheet Metal Manual for flashing configurations required.

4. Discrepancies between job site conditions and shop drawings shall be brought to the attention of the Architect for resolution.

5. Cutting and Fitting:

a. Cut panels neat, square, and true with shearing action cutters. Torch or power saw cutting is prohibited.

b. Openings 6 inches and larger: Shop fabricate and reinforce to maintain original load capacity.

c. Openings less than 6 inches: Field cutting is acceptable.

6. Dissimilar Metals or Materials:

a. Where panel or trim may come in contact with dissimilar metals or treated lumber, fabricate transition to facilitate drainage and minimize possibility of galvanic action. Galvanic action can cause panels and trim to fail prematurely.

b. At points of contact with dissimilar metal or treated lumber, coat panel and trim with protective paint or separate materials with a weatherproof underlayment.

c. Direct contact or run-off from CCA, ACQ, CA, or other treated lumber (outdoor wood) or fire retardant impregnated or treated wood shakes or siding can cause panels and trim to fail prematurely. Avoid contact with these materials.

B. Accessories, Flashings and Trims: Install trims, flashings, and roofing specialties according to Drawings and manufacturer's recommended details. Install with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation of all components.

C. Sealant Installation: Apply according to approved shop drawings and SMACNA Architectural Sheet Metal Manual recommendations.

1. Provide airtight and waterproof installation.

D. Installation Tolerances: Match dimensional tolerances of framing or substrate.

3.4 CLEANING

A. Repairs:

1. Touch up paint is not required for panels with scratches that do not expose metal.

2. Panels or flashings with finish damage exposing metal or with substrate damage shall be replaced.

B. Cleaning:

1. At completion of each day's work and at work completion, sweep panels, flashings, and gutters clean. Do not allow fasteners, cuttings, filings, or scraps to accumulate.

2. Clean exposed surfaces of work promptly after completion of installation.

3.5 PROTECTION

A. Protect Work as required to ensure that roofing will be without damage at Final Completion.

END OF SECTION 074113

SECTION 074213 - METAL COMPOSITE MATERIAL WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes metal composite material wall panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including manufacturer's installation instructions..

B. Shop Drawings: Include fabrication and installation layouts of metal composite material panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.

C. Samples: For each type of metal composite material panel indicated.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Warranties: Samples of special warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.

B. Manufacturer Qualifications: Company with a minimum of 5 years of continuous experience manufacturing panel material of the type specified:

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Performance Requirements: Provide composite metal panels which have been manufactured, fabricated and installed to withstand loads from deflection and thermal movement and to maintain performance criteria stated by manufacturer without defects, damage or failure.

B. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:

1. Wind Loads: As indicated on Drawings.

2. Other Design Loads: As indicated on Drawings.

3. Normal Deflection: Deflection of perimeter framing member not to exceed L/175 normal to plane of the wall; deflection of individual panels not to exceed L/60.

4. Anchor Deflection: At connection points of framing members to anchors, anchor deflection in any direction not to exceed 1/16 inch (1.6 mm).

C. Air Leakage (ASTM E283): Not more than 0.06 (cfm)/sf of wall area (0.003 (L/s) m2), when tested at 1.57 psf (0.075 kPa).

D. Water Penetration (ASTM E331): No water infiltration under static pressure at a differential of 10% of inward acting design load, 6.24 psf (0.299 kPa) minimum, after 15 minutes.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

F. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

G. Fire Propagation Characteristics: Metal composite material wall panel system passes NFPA 285 testing.

2.2 METAL COMPOSITE MATERIAL WALL PANELS

A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assemblies components, and accessories required for weathertight system.

B. Manufacturer: Provide the products listed below or approved equal:

1. Mitsubishi Plastics Composites America, Inc. Contact: 401 Volvo Parkway, Chesapeake, VA 23320; Telephone (800) 422-7270; Fax: (757) 436-1896; E-mail: info@alpolic.com; website: www.alpolic-northamerica.com.

C. Proprietary Product: ALPOLIC Composite Metal Panels, or approved equal..

1. Standard ALPOLIC composite metal panels.

a. Panel types: PE and FR as indicated on Drawings.

b. Color: As indicated on Drawings.

D. Aluminum-Faced Composite Metal Panels:

1. Core: Thermoplastic material that meets performance characteristics specified when fabricated into composite assembly. Standard or Fire retardant as indicated on Drawings.

2. Face Sheets: Aluminum alloy 3105 H14, 0.020 inch (0.51 mm) thick and as follows:

a. Spray coated with specified finish [Less than 1000 ft2 (93 m2) quantities].

b. Thermally bonded in a continuous process, under tension, to the core material.

3. Bond Integrity: Tested for resistance to delamination as follows:

a. Peel Strength (ASTM D1781): 22.5 in-lb/in (100 N-m/m) minimum.

b. No degradation in bond performance after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).

4. Fire Performance:

a. Flamespread (ASTM E84): 25 maximum (4 and 6 mm).

b. Smoke Developed (ASTM E84): 450 maximum (4 and 6 mm).

c. Surface Flammability (Modified ASTM E108): Pass (4 and 6 mm).

d. V-O Rating (4 mm): Comply with UL 94.

5. Production Tolerances:

a. Width: +/- 2 mm.

b. Length: +/- 4 mm.

c. Thickness (4 mm Panel): +/- 0.008 inch (0.2 mm).

d. Bow: Maximum 0.5% length or width.

e. Squareness: Maximum 0.2 inch (5 mm).

f. Edges of sheets shall be square and trimmed.

6. Panel Thickness: 4 mm.

2.3 ACCESSORIES

A. General: Provide fabricator's standard accessories, including fasteners, clips, anchorage devices and attachments.

2.4 RELATED MATERIALS

A. General: Refer to other related sections for related materials, including cold-formed metal framing, flashing and trim, joint sealers, aluminum windows, glass and glazing and curtain walls.

B. Panel Sealants: ASTM C 920; as recommended in writing by metal composite material panel manufacturer. Provide sealant types recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

2.5 FABRICATION

A. General: Shop fabricate to sizes and joint configurations indicated on the drawings.

1. Where final dimensions cannot be established by field measurements, provide allowance for field adjustment as recommended by the fabricator.

2. Form panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.

3. Fabricate with sharply cut edges, with no displacement of aluminum sheet or protrusion of core.

2.6 FINISHES

A. Factory Finish: Manufacturer's standard fluoropolymer paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.

2.7 SOURCE QUALITY

A. Source Quality: Obtain composite panel products from a single manufacturer.

2.8 FABRICATION

A. General: Fabricate and finish metal composite material panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

2.9 FINISHES

A. Panels and Accessories:

1. Manufacturer's standard Two-Coat or Three-coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.2 EXAMINATION

A. Site Verification of Conditions: Verify that substrate conditions are acceptable for product installation.

3.3 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.4 INSTALLATION

A. General:

1. Install panels plumb, level and true, in compliance with manufacturer's instructions and recommendations.

2. Anchor panels securely in place, in accordance with manufacturer's approved shop drawings.

3. Comply with manufacturer's instructions for installation of concealed fasteners and with provisions of Section 079200 for installation of joint sealers.

4. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels: 0.25 inch (6.4 mm) in 20 feet (6.1 m), non-cumulative.

3.5 ADJUSTING

A. Adjusting:

1. Repair panels with minor damage such that repairs are not discernible at a distance of 10 feet (3.1 m).

2. Remove and replace panels damaged beyond repair.

3. Remove protective film immediately after installation of joint sealers and immediately prior to completion of composite metal panel work.

4. Remove from project site damaged panels, protective film and other debris attributable to work of this section.

3.6 CLEANING

A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris.

3.7 PROTECTION

A. Protection: Protect installed product's finish surfaces from damage during construction.

1. Institute protective measures as required to ensure that installed panels will not be damaged by work of other trades.

END OF SECTION 074213

SECTION 074646 - FIBER-CEMENT SIDING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fiber-cement vertical panels, battens, trim, molding and accessories.

B. Related Requirements:

1. Section 062013 "Exterior Finish Carpentry for wood furring for Fiber Cement Siding.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product, including.

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation methods.

B. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

C. Samples: For fiber-cement siding panels including related trim and accessories.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates and test reports.

B. Sample warranty.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

1.5 WARRANTY

A. Product Warranty: Manufacturer's Limited, non-pro-rated product warranty.

1. HardiePanel HZ10 vertical siding panels for 30 years from date of Substantial Completion.

2. HardiePlank HZ10 lap siding for 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: James Hardie Building Products, Inc., which is located at: 26300 La Alameda Suite 400 ; Mission Viejo, CA 92691; Toll Free Tel: 866-274-3464; Tel: 949-367-4980; Email: request info (info@jameshardie.com); Web: www.jameshardiecommercial.com

B. Requests for approval of equal substitutions may be considered according to contract conditions and/or Architects and Owner requirements.

2.2 FIBER-CEMENT SIDING

A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 0 and smoke developed index of 5 or less when tested according to ASTM E 84.

1. Products: Vertical Siding: Subject to compliance with requirements, provide the following:

a. James Hardie Building Products, Inc.; Vertical Siding: HardiePanel HZ10 siding as manufactured by James Hardie Building Products, Inc.

b. Type: "Cedarmill" Vertical siding panel as indicated on Drawings or selected by Architect

c. Panel size: 4 feet by 8 feet, 4 feet by 9 feet or 4 feet by 10 feet as indicated on Drawings or selected by Architect.

d. Trim: HardieTrim HZ10 "Rustic" Trim boards and "Rustic" Trim batten boards as manufactured by James Hardie Building Products, Inc.

2. Products: Lap Siding: Subject to compliance with requirements, provide the following:

a. James Hardie Building Products, Inc.; Lap: HardiePlank HZ10 siding as manufactured by James Hardie Building Products, Inc.

b. Type: Plank width, exposure and finish as indicated on Drawings.

c. Trim: As indicated on Drawings.

B. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.

C. Nominal Thickness: Not less than 5/16 inch (8 mm).

D. Factory Priming: Manufacturer's standard acrylic primer.

2.3 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.

B. Flashing: Provide galvanized or stainless-steel flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

C. Weather Barrier: "Engineered for ClimateTM HardieWrap TM" weather barrier, unless indicated otherwise on Drawings or required by local building code requirements.

D. Fasteners: Use fasteners recommended by manufacturer.

1. Wood Framing: For fastening to wood, use corrosion resistant, galvanized nails as recommended by manufacturers for project conditions, of sufficient length to penetrate a minimum of 1 inch (25 mm) into substrate, or as recommended by siding manufacturer.

2. Metal Framing: For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch (6 mm), or three screw-threads, into substrate, or as recommended by siding manufacturer.

3. Masonry Walls: For fastening to masonry, use Aerico Stud Nail, ET&F ASM No.-144-125, 0.14 inch (3.6 mm) shank by 0.30 inch (7.6 mm) head by 2 inches (51 mm) long corrosion resistant nails, , or as recommended by siding manufacturer.

2.4 FINISHES

A. Factory Primer: Provide factory applied universal primer.

1. Primer: Factory primed by James Hardie.

2. Topcoat: Refer to Section 09900 and Exterior Finish Schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Nominal 2 inch by 4 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.

1. Install water-resistive barriers and claddings to dry surfaces.

2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.

3. Protect siding from other trades.

C. Minimum 20 gauge 3-5/8 inch (92 mm) C-Stud 16 inches maximum on center or 16 gauge 3-5/8 inches (92 mm) C-Stud 24 inches (610 mm) maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.

1. Install water-resistive barriers and claddings to dry surfaces.

2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.

3. Protect siding from other trades.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Install a water-resistive barrier where indicated on Drawings as required in accordance with local building code requirements.

D. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements.

E. Install Engineered for ClimateTM HardieWrapTM weather barrier in accordance with local building code requirements.

F. Use HardieWrapTM Seam Tape and joint and laps.

G. Install and HardieWrapTM flashing, HardieWrapTM Flex Flashing.

3.3 INSTALLATION - HARDIEPANEL HZ10 VERTICAL SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Block framing between studs where HardiePanel siding horizontal joints occur.

C. Install PT wood furring strips in accordance with siding manufacturer's requirements.

D. Install metal Z flashing and provide a 1/4 inch (6 mm) gap at horizontal panel joints.

E. Place fasteners no closer than 3/8 inch (9.5 mm) from panel edges and 2 inches (51 mm) from panel corners.

F. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

G. Maintain clearance between siding and adjacent finished grade.

H. Specific framing and fastener requirements refer to Tables 2 and 3 in National Evaluation Service Report No. NER-405.

3.4 INSTALLATION - HARDIEPLANK HZ10 LAP SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

D. Align vertical joints of the planks over framing members.

E. Maintain clearance between siding and adjacent finished grade.

F. Locate splices at least one stud cavity away from window and door openings.

G. Use off-stud metal joiner in strict accordance with manufacturer's installation instructions.

H. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

I. Face nail to sheathing.

J. Locate splices at least 12 inches (305 mm) away from window and door openings.

3.5 INSTALLATION - HARDIETRIM HZ10 BOARDS

A. Install materials in strict accordance with manufacturer's installation instructions. Install flashing around all wall openings.

B. Fasten through trim into structural framing or code complying sheathing. Fasteners must penetrate minimum 3/4 inch (19 mm) or full thickness of sheathing. Additional fasteners may be required to ensure adequate security.

C. Place fasteners no closer than 3/4 inch (19 mm) and no further than 2 inches (51 mm) from side edge of trim board and no closer than 1 inch (25 mm) from end. Fasten maximum 16 inches (406 mm) on center.

D. Maintain clearance between trim and adjacent finished grade.

E. Trim inside corner with a single board trim both side of corner.

F. Outside Corner Board Attach Trim on both sides of corner with 16 gage corrosion resistant finish nail 1/2 inch (13 mm) from edge spaced 16 inches (406 mm) apart, weather cut each end spaced minimum 12 inches (305 mm) apart.

G. Allow 1/8 inch gap between trim and siding.

H. Seal gap with high quality, paint-able caulk.

I. Shim frieze board as required to align with corner trim..

J. Fasten through overlapping boards. Do not nail between lap joints.

K. Overlay siding with single board of outside corner board then align second corner board to outside edge of first corner board. Do not fasten HardieTrim boards to HardieTrim boards.

L. Shim frieze board as required to align with corner trim.

M. Install HardieTrim Fascia boards where indicated on drawings.

3.6 FINISHING

A. Finish factory primed siding with paint products specified in Section 099113 – "Exterior Painting" within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.7 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 074646

SECTION 075423 - THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING - PLYWOOD DECK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered thermoplastic polyolefin (TPO) roofing systems installed over plywood roof deck.

2. Base Sheet

3. Roof insulation.

4. Walkways.

B. The project consists of providing and installing Versico's VersiWeld (TPO) Adhered Roofing System as outlined below – "Basis of Design":

1. 'Type 1' - Apply the VersiWeld Adhered Roofing System in conjunction with an FR Base Sheet and 1.9" (minimum) SecurShield Polyiso over the new Plywood roof deck. (UL Class A)

2. 'Type 2' - Apply the VersiWeld Adhered Roofing System in conjunction with 1.9" (minimum) SecurShield Polyiso over the new Plywood roof deck. (UL Class B)

1.2 EXTENT OF WORK

A. Provide all labor, materials, tools, equipment, and supervision necessary to complete the installation of the VersiWeld TPO Adhered Roofing System including flashings and insulation as specified herein and as indicated on the drawings in accordance with the manufacturer's most current specifications and details.

B. The roofing contractor shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.

C. The roofing contractor shall confirm all given information and advise the building owner, prior to bid, of any conflicts that will affect their cost proposal.

D. Any contractor who intends to submit a bid using a roofing system other than the approved manufacturer must submit for pre-qualification in writing fourteen (14) days prior to the bid date. Any contractor who fails to submit all information as requested will be subject to rejection. Bids stating "as per plans and specs" will be unacceptable.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.

2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

5. Review structural loading limitations of roof deck during and after roofing.

6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

7. Review governing regulations and requirements for insurance and certificates if applicable.

8. Review temporary protection requirements for roofing system during and after installation.

9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with requirements of the current edition of the California Green Building Standards Code – Nonresidential, Tier 1, Solar Reflectance Index requirements.

2. Product Data: For adhesives and sealants, indicating that adhesives and sealants comply with VOC content requirements the current edition of the California Green Building Standards Code – Nonresidential and agencies having jurisdiction.

C. Shop Drawings: Shop drawings showing layout, details of construction and identification of materials, including the following:

1. Layout and thickness of insulation.

2. Base flashings and membrane termination details.

3. Flashing details at penetrations.

4. Tapered insulation layout, thickness, and slopes.

5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

D. Samples: For the following products:

1. Roof membrane and flashings, of color required.

2. Walkway pads or rolls, of color required.

1.5 INFORMATIONAL SUBMITTALS

A. Manufacturer/Installer Certificates:

1. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

2. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal .015 mil or thicker.

3. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

a. Submit evidence of compliance with performance requirements.

4. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

A. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

B. Maintenance data.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Exterior Fire-Test Exposure: ASTM E 108, Class A or Class B as indicated; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

D. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

E. The VersiWeld Membrane Roofing System 'Type 1' must achieve a UL Class A. The VersiWeld Membrane Roofing System 'Type 2' must achieve a UL Class B.

F. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to

1. ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies"

2. American Society of Civil Engineers (ASCE 7)

3. California Building Code (CBC)

G. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made by others are not acceptable.

H. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.

I. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.

J. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

K. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.

L. The VersiWeld TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance, and shall comply with requirements of current version of California Green Building Standards Code – Nonresidential. When tested in accordance with ASTM C1549, the VersiWeld White material has an initial solar reflectance of 0.79 and a 3-year aged reflectance of 0.70. The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of .90 and a 3-year aged emittance of 0.86 were achieved.

M. The VersiWeld White TPO membrane meets the emittance requirements set forth by the USGBC (U. S. Green Building Council) for their LEED (Leadership in Energy and Environmental Design) Program. The VersiWeld White TPO material has an emittance of 0.90 (when tested in accordance with ASTM E408) and an SRI (solar reflectance index) of 99 (calculated using ASTM E 1980).

N. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.

B. Comply with the manufacturer's written instructions for proper material storage.

1. Store VersiWeld membrane in the original undisturbed plastic wrap in a cool, shaded area. VersiWeld membrane that has been exposed to the elements for approximately 7 days must be prepared with Weathered Membrane Cleaner prior to hot air welding.

2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.

3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.

C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.

D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.9 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.

1.10 WARRANTY

A. Provide manufacturer's 20 year Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 55 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.

1. When white VersiWeld membrane is specified, a Reflectivity Warranty Amendment is available indicating the membrane will meet the Energy Star program reflectivity guidelines for both new and aged membrane for a period of 10 years.

B. Pro-rated System Warranties shall not be accepted.

C. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products (including insulation, fasteners, fastening plates, prefabricated accessories and edgings) must be manufactured and/or supplied by the roofing system manufacturer and covered by the warranty.

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

A. Basis of Design:

1. System and products specified for adhered thermoplastic polyolefin (TPO) membrane roofing are manufactured by Versico Incorporated, and are intended to establish standards for quality and performance. Thermoplastic Polyolefin (TPO) membrane roofing systems and products by other manufacturers listed below, that are equal in all aspects to those named, may be proposed as equals or alternates.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:

1. Versico Incorporated – Basis of Design.

2. Firestone Building Products.

3. Johns Manville. A Berkshire Hathaway Company

C. TPO Sheet Membrane: ASTM D 6878/D 6878M:, Furnish VersiWeld reinforced TPO Membrane. Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal .015 mil thick or greater.

1. Membrane Thickness: 60 mils (1.5 mm), nominal.

2. Exposed Face Color: White.

2.3 INSULATION/UNDERLAYMENT

A. When applicable, insulation shall be installed in multiple layers. The first and second layers of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.

B. Insulation shall be SecurShield Polyis as supplied by Versico. Minimum R-value required is R-10.8 or 1.9" total thickness unless noted otherwise on Drawings.

1. Versico SecurShield Polyisocyanurate– A foam core insulation board covered on both sides with a coasted glass fiber mat facer meeting ASTM C 1289-06, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.

2. Versico FR Base Sheet 1S: Non-asphaltic fiberglass-based underlayment that meets or exceeds ASTM D226 or D4869 Type I or II performance. Roll Size 48" x 250' (where required for 'Type 1', UL Class A roof)

C. Tapered Insulation: Provide factory-tapered insulation boards where indicated or required.

1. Material: Match roof insulation.

2. Minimum Thickness: 1/4 inch (6.35 mm).

3. Slope:

a. Roof Field: 1/4 inch per foot (1:48) unless otherwise indicated on Drawings.

b. Saddles and Crickets: 1/2 inch per foot (1:24) unless otherwise indicated on Drawings.

2.4 FASTENING COMPONENTS

To be used for mechanical attachment of insulation and to provide additional membrane securement:

A. Fasteners, Plates and Bars

1. HPV Fasteners: a threaded, #14 fastener with a #3 phillips drive used with steel and wood roof decks.

2. HPVX Fasteners: A heavy duty #15 threaded fastener with a #3 phillips drive used for membranre or insulation securement into steel, wood plank or minimum 15/32 inch thick plywood when increased pullout resistance is desired.

3. InsulTite Fasteners: A threaded #12 fastener with #3 phillips drive used for insulation attachment into steel or wood decks.

4. Term Bar Nail-Ins: A 1-1/4" long expansion anchor with a zinc plated steel drive pin used for fastening the Versico Termination Bar or Seam Fastening Plates to concrete, brick, or block walls.

5. HPVX Plates: A 2-3/8" diameter metal barbed fastening plate used with Versico HPVX or MP-14-10 Fasteners for membrane securement. This plate can be used for insulation securement.

6. Insulation Fastening Plates: A nominal 3 inch diameter plastic or metal plate used for insulation attachment only.

2.5 ADHESIVES, CLEANERS AND SEALANTS

A. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. All products shall be furnished by Versico and specifically formulated for the intended purpose.

C. Low VOC Bonding Adhesive 1168: This product meets the <250 gpl VOC (volatile organic compound) content requirements of the OTC Model Rule for Single Ply Roofing Adhesives. A high strength, solvent-based contact adhesive the allows bonding of TPO membrane to various porous and non-porous substrates. Apply at a rate of 60 ft2 per gallon finished surface. Available in 5-gallon cans. This product complies with southern California counties with additional restrictions on solvents. See Versico's Product Data Sheet for a listing of the counties involved.

D. Water Cut-Off Mastic: Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).

E. Universal Single-Ply Sealant: A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.

F. Thermoplastic One-Part Pourable Sealer: A one-part, moisture curing, elastomeric polyether sealant used to fill TPO Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 2 TPO Molded Pourable Sealant Pockets.

G. Weathered Membrane Cleaner: Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).

H. TPO Low VOC Primer:: A solvent-based, low solids primer used to prepare the surface of VersiWeld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS. This low VOC product is ideal for use in states where environmental issues are a concern.

I. Cav-Grip Primer: a low VOC contact adhesive used to adhere membrane to walls.

2.6 METAL EDGING AND MEMBRANE TERMINATIONS

A. General: All metal edging s shall be tested and meet ANSI/SPRI ES-1 standards and comply with International Building Code.

B. Termination Bar: a 1" wide and .098" thick extruded aluminum bar pre-punched 6" on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.7 WALKWAYS

A. Protective surfacing for roof traffic shall be VersiWeld TPO Walkway Rolls installed per manufacturer's requirements

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CONSTRUCTION

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PROPOSED RETAIL BUILDING
2219 EL CAMINO REAL
REDWOOD CITY, CA 94063

MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
△		
△		
△		
△		
△		

TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002

DRAWN: EMQ CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

SP.2

SHEET OF

PART 3 - EXECUTION

3.1 ROOFING INSTALLATION, GENERAL

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, job site considerations and weather restrictions.

C. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.2 BASE SHEET

A. General: Use of FR Base Sheet required to achieve a UL Class A assembly on the plywood deck ('Type 1' roof).

B. Installation:

1. Surface Preparation: The substrate must be dry. The surface shall have a smooth finish and be free of voids, spalled areas, sharp protrusions, loose aggregate. In the event of rain, the substrate must be allowed to dry before base sheet is installed.

2. Application: Apply Versico FR Base Sheet from low to high point, in a shingle fashion, so that laps will shed water. Overlap all edges at lease 2-1/2". End laps shall be staggered. Place membrane carefully so as to avoid wrinkles and fishmouths.

3.3 INSULATION PLACEMENT AND ATTACHMENT

A. For "Type 1" UL Class A roof: Install insulation over the FR Base Sheet with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints horizontally and vertically if multiple layers are provided.

B. For "Type 2" UL Class B roof: Install insulation over roof deck with boards butted tightly together with no joints or gaps greater than 1/4 inch. Stagger joints horizontally and vertically if multiple layers are provided.

C. Secure insulation to the substrate with the required mechanical fasteners in accordance with the manufacturer's specifications.

3.4 MEMBRANE PLACEMENT AND ATTACHMENT

A. Position VersiWeld membrane over the acceptable substrate. Fold membrane sheet back onto itself so half the underside of the membrane is exposed.

B. Apply Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.

1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.

2. Fold back the unbonded half of the sheet and repeat the bonding procedures.

C. Position adjoining sheets to allow a minimum overlap of 2 inches to provide a minimum 1-1/2" hot air weld.

D. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

3.5 MEMBRANE HOT AIR WELDING PROCEDURES

A. Hot air weld the VersiWeld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller immediately after welder crossed the membrane step-off to ensure a continuous hot air welded seam. Note: When using 60-mil thick or thicker membrane, all splice intersections shall be overlaid with VersiWeld T-joint covers or non-reinforced flashing.

B. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).

C. Repair all seam deficiencies the same day they are discovered.

D. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

3.6 FLASHING

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using VersiWeld reinforced membrane. VersiWeld non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of prefabricated accessories is not feasible.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.7 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.

3.8 DAILY SEAL

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.9 CLEAN UP

A. Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION 075423

SECTION 075424 - THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING – CONCRETE DECK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Adhered fleece backed thermoplastic polyolefin (TPO) roofing system installed over concrete roof deck.
2. Roof insulation.
3. Walkways.

B. The project consists of installing Versico's VersiFleece TPO white 115 membrane adhered with DASH Adhesive as outlined below:

1. Apply the VersiFleece TPO Adhered Roofing System in conjunction with 1.9" SecurShield Polyiso over the new concrete roof deck.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Product Test Reports: For roof materials, documentation indicating that roof materials comply with requirements of the current edition of the California Green Building Standards Code – Nonresidential, Tier 1, Solar Reflectance Index requirements.
2. Product Data: For adhesives and sealants, indicating that adhesives and sealants comply with VOC content requirements the current edition of the California Green Building Standards Code – Nonresidential and agencies having jurisdiction.

C. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane termination details.
3. Flashing details at penetrations.
4. Tapered insulation layout, thickness, and slopes.
5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

D. Samples: For the following products:

1. Roof membrane and flashings, of color required.
2. Walkway pads or rolls, of color required.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturer/Installer Certificates:

1. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
2. Certification from the membrane manufacturer indicating the membrane thickness over the reinforcing scrim (top ply membrane thickness) is nominal 15 mil or thicker.
3. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
   a. Submit evidence of compliance with performance requirements.
4. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

B. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

B. Maintenance data.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Exterior Fire-Test Exposure: ASTM E 108, Class A as indicated; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

D. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

E. The VersiFleece Membrane Roofing System 1' must achieve a UL Class A.

F. The specified roofing assembly must have been successfully tested by a qualified testing agency to resist the design uplift pressures calculated according to

1. ANSI/SPRI WD-1 "Wind Design Standard Practice for Roofing Assemblies"
2. American Society of Civil Engineers (ASCE 7)
3. California Building Code (CBC)

G. The membrane must be manufactured by the material supplier. Manufacturer's supplying membrane made by others are not acceptable.

H. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.

I. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years successful experience installing single-ply TPO roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.

J. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.

K. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the specifier. Any deviation from the manufacturer's installation procedures must be supported by a written certification on the manufacturer's letterhead and presented for the specifier's consideration.

L. The VersiFleece TPO White membrane meets CRRC (Cool Roof Rating Council) for reflectance and emittance and shall comply with requirements of current version of California Green Building Standards Code – Nonresidential. When tested in accordance with ASTM C1549, the VersiFleece White material has an initial solar reflectance of 0.79 and a 3-year aged reflectance of 0.70. The material has also been tested for emittance in accordance with ASTM C1371; an initial emittance of .90 and a 3-year aged emittance of 0.86 were achieved.

M. The VersiFleece White TPO membrane meets the emittance requirements set forth by the USGBC (U. S. Green Building Council) for their LEED (Leadership in Energy and Environmental Design) Program. The VersiFleece White TPO material has an emittance of 0.90 (when tested in accordance with ASTM E408) and an SRI (solar reflectance index) of 99 (calculated using ASTM E 1980).

N. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to determine whether or not corrective work will be required before the warranty will be issued. Notify the building owner seventy-two (72) hours prior to the manufacturer's final inspection.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.

B. Comply with the manufacturer's written instructions for proper material storage.

1. Store VersiFleece membrane in the original undisturbed plastic wrap in a cool, shaded area. VersiFleece membrane that has been exposed to the elements for approximately 7 days must be prepared with Weathered Membrane Cleaner prior to hot air welding.
2. Store curable materials (adhesives and sealants) between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature before using.
3. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.

C. Insulation must be on pallets, off the ground and tightly covered with waterproof materials.

D. Any materials which are found to be damaged shall be removed and replaced at the applicator's expense.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.

1.9 WARRANTY

A. Provide manufacturer's 20 year Total System Warranty covering both labor and material with no dollar limitation. The maximum wind speed coverage shall be peak gusts of 55 mph measured at 10 meters above ground level. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.

1. When white VersiFleece membrane is specified, a Reflectivity Warranty Amendment is available indicating the membrane will meet the Energy Star program reflectivity guidelines for both new and aged membrane for a period of 10 years.

B. Pro-rated System Warranties shall not be accepted.

C. Evidence of the manufacturer's warranty reserve shall be included as part of the project submittals for the specifier's approval.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products (including insulation, fasteners, fastening plates, prefabricated accessories and edgings) must be manufactured and/or supplied by the roofing system manufacturer and covered by the warranty.

2.2 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING

A. Basis of Design:

1. System and products specified for adhered thermoplastic polyolefin (TPO) membrane roofing are manufactured by Versico Incorporated, and are intended to establish standards for quality and performance. Thermoplastic Polyolefin (TPO) membrane roofing systems and products by other manufacturers listed below, that are equal in all aspects to those named, may be proposed as equals or alternates.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved equal:

1. Versico Incorporated – Basis of Design.
2. Firestone Building Products.
3. Johns Manville. A Berkshire Hathaway Company

C. Furnish VersiFleece TPO white 115-mil reinforced TPO (Thermoplastic Polyolefin) membrane. Membrane thickness over the reinforcing scrim (top-ply thickness) shall be nominal .015-mil or thicker.

D. Membrane Color: White top surface with SRI (solar reflectance index) not less than 110, tested in accordance with ASTM E 1980.

E. White TPO Membrane Sheets are 6' wide by 100' long, and 12' wide by 50' or 100' long.

F. Membrane Weathering Performance: The TPO membrane shall be formulated with Octaguard XT Weathering Package to withstand 60 days of exposure at a 275° F temperature and a minimum of 17,000 kj/m2 xenon arc resistance at 80°F without cracking or showing signs of material failure, exceeding ASTM 6878.

G. White TPO Membrane Sheets are 6' wide by 100' long, and 12' wide by 50' or 100' long.

2.3 INSULATION/UNDERLAYMENT

A. When applicable, insulation shall be installed in multiple layers. The first and second layers of insulation shall be mechanically fastened to the substrate in accordance with the manufacturer's published specifications.

B. Insulation shall be SecurShield Polyis as supplied by Versico. Minimum R-value required is R-10.8 or 1.9" total thickness unless noted otherwise on Drawings.

1. Versico SecurShield Polyisocyanurate– A foam core insulation board covered on both sides with a coasted glass fiber mat facer meeting ASTM C 1289-06, Type II, Class 2, Grade 2 (20 psi) or Grade 3 (25 psi). The product is available in 4' x 8' standard size with a thickness from 1 to 4 inches. 4' x 4' tapered panels are also available.

C. Tapered Insulation: Provide factory-tapered insulation boards where indicated or required.

1. Material: Match roof insulation.
2. Minimum Thickness: 1/4 inch (6.35 mm).
3. Slope:
   a. Roof Field: 1/4 inch per foot (1:48) unless otherwise indicated on Drawings.
   b. Saddles and Crickets: 1/2 inch per foot (1:24) unless otherwise indicated on Drawings.

2.4 FASTENING COMPONENTS

To be used for additional membrane securement where indicated:

A. Fasteners, Plates and Bars

1. CD-10 Fasteners: A non-threaded, hammer driven fastener used with structural concrete roof decks rated 3,000 psi or greater.

B. Insulation Adhesive:

1. DASH and Flexible DASH Adhesive: A two component insulating urethane adhesive used to attach insulation and VersiFleece membrane. Packaging formats include 50 and 15 gallon drums as well as Dual Tanks, Dual Cartridges and 5 gallon Bag in a Box formats.

2.5 ADHESIVES, CLEANERS AND SEALANTS

A. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. All products shall be furnished by Versico and specifically formulated for the intended purpose.

C. DASH and Flexible DASH Adhesive: A two component insulating urethane adhesive used to attach insulation and VersiFleece membrane. Packaging formats include 50 and 15 gallon drums as well as Dual Cartridges and 5 gallon Bag in a Box formats.

D. Water Cut-Off Mastic: Used as a mastic to prevent moisture migration at drains, compression terminations and beneath conventional metal edging (at a coverage rate of approximately 10' per tube or 100' per gallon).

E. Universal Single-Ply Sealant: A 100% solids, solvent free, voc free, one part polyether sealant that provides a weather tight seal to a variety of building materials. It is white in color and is used for general caulking such as above termination bars and metal counter flashings and at scuppers.

F. Thermoplastic One-Part Pourable Sealer: A one-part, moisture curing, elastomeric polyether sealant used to fill TPO Molded Pourable Sealant Pockets. Packaged in 4, 2-liter foil pouches inside a reusable plastic bucket. 1 pouch will fill 2 TPO Molded Pourable Sealant Pockets.

G. Weathered Membrane Cleaner: Used to prepare membrane for heat welding that has been exposed to the elements or to remove general construction dirt at an approximate coverage rate of 400 square feet per gallon (one surface).

H. TPO Low VOC Primer:: A solvent-based, low solids primer used to prepare the surface of VersiWeld Membrane prior to application of Pressure-Sensitive Coverstrip and TPO Pressure-Sensitive RUSS. This low VOC product is ideal for use in states where environmental issues are a concern.

I. Cav-Grip Primer: a low VOC contact adhesive used to adhere membrane to walls.

2.6 METAL EDGING AND MEMBRANE TERMINATIONS

A. General: All metal edging s shall be tested and meet ANSI/SPRI ES-1 standards and comply with International Building Code.

B. Termination Bar: a 1" wide and .098" thick extruded aluminum bar pre-punched 6" on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.7 WALKWAYS

A. Protective surfacing for roof traffic shall be VersiWeld TPO Walkway Rolls installed per manufacturer's requirements

PART 3 - EXECUTION

3.1 ROOFING INSTALLATION, GENERAL

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

B. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, job site considerations and weather restrictions.

C. Position sheets to accommodate contours of the roof deck and shingle splices to avoid bucking water.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
2. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than **[75]** <**Insert number**> percent, or as recommended by roofing system manufacturer, when tested according to ASTM F 2170.
   a. Test Frequency: One test probe per each 1000 sq. ft. (93 sq. m), or portion thereof, of roof deck, with not less than three tests probes.
   b. Submit test reports within 24 hours after performing tests.
3. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
4. Verify that joints in precast concrete roof decks have been grouted flush with top of concrete.

3.3 INSULATION PLACEMENT AND ATTACHMENT

A. Install insulation or membrane underlayment over the substrate with boards butted together. Fill joints or gaps greater than 1/4 inch with DASH Adhesive. Stagger joints both horizontally and vertically if multiple layers are provided.

B. Secure insulation to the substrate with DASH Adhesive in accordance with the manufacturer's specifications.

3.4 MEMBRANE PLACEMENT AND BONDING

A. Position and unroll successive sheets and align to provide a minimum 2 inch overlap (use pre-marked overlap line) along the selvage edge. At end laps (along the width of the sheet), membrane shall be butted together which will be overlaid with 6 inch wide VersiFleece TPO Reinforced Membrane and hot air welded on all edges.

B. VersiFleece Membrane shall be fully adhered to an acceptable substrate with Versico DASH Adhesive. The adhesive is spray applied or extruded to the substrate only and the membrane is rolled into the wet adhesive once it has foamed up and reached string/gel time (approximately 2 minutes). Roll the membrane with a weighted (100 - 150 pounds) steel roller to set the membrane into the adhesive.

1. Exercise care to prevent overspray onto the membrane. If DASH Adhesive should contaminate the splice area, immediately (while the adhesive is still in liquid form) clean with Weathered Membrane Cleaner or allow DASH Adhesive to cure and remove with a paint-type scraper.

C. Position adjoining sheets to allow a minimum overlap of 2 inches to provide a minimum 1-1/2" hot air weld.

D. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

3.5 MEMBRANE HOT AIR WELDING PROCEDURES

A. General: The VersiFleece membrane has a selvage edge (the fleece-backing is discontinued) along the length of the sheet for membrane splicing. Selvage edges are not provided along the width of the membrane; adjoining membrane sheets must be butted together and overlaid with 6 inch wide VersiFleece TPO Reinforced membrane heat welded on all sides.

B. Hot Air Welding Procedures

1. Hot air weld the VersiFleece TPO membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's specifications. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.
   a. When using 115-mil thick or thicker membrane, all splice intersections shall be overlaid with VersiFleece TPO T-Joint covers or non-reinforced flashing
2. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).
3. Repair all seam deficiencies the same day they are discovered.
4. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

3.6 FLASHING

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using VersiFleece TPO membrane or VersiFleece TPO reinforced membrane. VersiFleece TPO non-reinforced membrane can be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of pre-molded accessories is not feasible.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.7 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the specifier's drawing.

3.8 DAILY SEAL

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.9 CLEAN UP

A. Perform daily clean up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION 075423

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.
4. Formed steep-slope roof sheet metal fabrications.
5. Formed wall sheet metal fabrications.
6. Formed equipment support flashing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.3 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's Architectural Sheet Metal Manual. Conform to dimensions and profiles shown unless more stringent requirements are indicated.

B. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.4 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leak-proof, secure, and non-corrosive installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation.

1. Surface: Mill phosphatized for field painting.
2. Color: As indicated on Drawings.

2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. (0.16 kg/sq.) minimum.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal [or manufactured item].

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
   a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
   b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
   c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Solder:

1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED REGLETS

A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and where indicated with interlocking counterflashing on exterior face, of same metal as reglet.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Fry Reglet Corporation.
2. Material: Galvanized steel, 0.0276 inch thick or.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
   a. Product: Fry Springlok Type SM; use with Springlok Flashing.
4. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
   a. Product: Fry Springlok Type ST; use with Springlok Flashing.
5. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
   a. Product: Fry Vinylok Flashing Retainer.
6. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
   a. Product: Fry Windlok Clip.

2.6 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Obtain field measurements for accurate fit before shop fabrication.
2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter brackets and gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.

1. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen or Wire-ball downspout strainer where indicated.

B. Built-in Gutters: Fabricate to cross section required, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Fabricate expansion joints and accessories from same metal as gutters unless otherwise indicated.

1. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen or Wire-ball downspout strainer where indicated.
2. Fabricate from the Following Materials:
   a. Stainless Steel: 0.016 inch (0.40 mm) thick.

C. Downspouts: Fabricate downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors]

1. Fabricate from the following materials:
   a. Galvanized Steel: Thickness as indicated on Drawings.

D. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.

E. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes. Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.

F. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Stainless Steel: 0.019 inch (0.48 mm), or Thickness as indicated on Drawings.

2.8 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 12-foot- (3.6-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, fasten and seal, solder or weld watertight.

1. Fabricate from the Following Materials:
   a. Galvanized Steel: Thickness as indicated on Drawings.

B. Base Flashing: Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.
2. Manufacturer: Fry Reglet Corporation, Alhambra, CA (800) 237-9773; www.fryreglet.com.

C. Counterflashing and Flashing Receivers: Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.
2. Manufacturer: Fry Reglet Corporation, Alhambra, CA (800) 237-9773; www.fryreglet.com.

D. Roof-Penetration Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.0336 inch thick.

E. Roof-Drain Flashing: Fabricate from the following materials:

1. Lead: 4.0 lb/sq. ft., hard tempered.

2.9 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.

B. Valley Flashing: Fabricate from the following materials:

1. Stainless Steel: [0.016 inch (0.40 mm)] thick.
1. Galvanized Steel: Thickness as indicated on Drawings.

C. Drip Edges: Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.

D. Eave, Rake, Ridge, and Hip Flashing: Fabricate from the following materials:

1. Galvanized Steel: Thickness as indicated on Drawings.

2.10 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Equipment Support Flashing: Fabricate from the following material:

1. Galvanized Steel: 0.0276 inches thick.

B. Door Drips: Provide at unprotected exterior doors, except aluminum entrance doors.

1. Fabricate from the Following Materials:
   a. Galvanized Steel: 0.0276 inches thick.

2.11 FINISHES

A. Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.

1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches (50 mm).

3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of uncoated-aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder metallic-coated steel sheet.
2. Do not use torches for soldering.
3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
4. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
5. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.

3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m)

C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.

D. Splash Pans: Install where downspouts discharge on low-slope roofs] <Insert surface>. Set in asphalt roofing cement or elastomeric sealant compatible with the substrate.

E. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

F. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch (25 mm) below [scupper] [or] [gutter] discharge.

G. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with [elastomeric] [butyl] sealant and clamp flashing to pipes that penetrate roof.

3.6 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.7 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof curbs.
2. Equipment supports.
3. Roof hatches and safety posts.
4. Stationary louvers.
5. Soffit louvers.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of roof accessory.

B. Shop Drawings: For roof accessories.

C. Samples: For each exposed product and for each color and texture specified.

1.3 QUALITY ASSURANCE

A. Sheet Metal Standard: Comply with SMACNA Architectural Sheet Metal Manual details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.5 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leak-proof, weather tight, secure, and non-corrosive installation.

1. With Architect's review, adjust location of roof accessories that would interrupt roof drainage routes, roof expansion joints, and similar construction elements.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation and mill phosphatized for field painting where indicated.

1. Mill-Phosphatized Finish: Manufacturer's standard for field painting.
2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
3. Baked-Enamel or Powder-Coat Finish: After cleaning and pretreating, apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

C. Aluminum Sheet: ASTM B 209 (ASTM B 209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.

1. Mill Finish: As manufactured.
2. Factory Prime Coating: Where field painting is indicated, apply pretreatment and white or light-colored, factory-applied, baked-on epoxy primer coat, with a minimum dry film thickness of 0.2 mil (0.005 mm).
3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil (0.013 mm).

D. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise mill finished.

E. Stainless-Steel Sheet and Shapes: ASTM A 240/A 240M or ASTM A 666, Type 304.

F. Steel Shapes: ASTM A 36/A 36M, hot-dip galvanized according to ASTM A 123/A 123M unless otherwise indicated.

G. Steel Tube: ASTM A 500/A 500M, round tube.

H. Galvanized-Steel Tube: ASTM A 500/A 500M, round tube, hot-dip galvanized according to ASTM A 123/A 123M.

I. Steel Pipe: ASTM A 53/A 53M, galvanized.

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.

B. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction,[containing no arsenic or chromium,] and complying with AWPA C2; not less than 1-1/2 inches (38 mm) thick.

C. Underlayment:

1. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
2. Polyethylene Sheet: 6-mil- (0.15-mm-) thick polyethylene sheet complying with ASTM D 4397.
3. Slip Sheet: Building paper, 3 lb/100 sq. ft. (0.16 kg/sq. m) minimum, rosin sized.
4. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:

D. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

E. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.

2.3 Asphalt Roofing Cement: ASTM D 4586/D 4586M, asbestos free, of consistency required for

2.4 ROOF CURBS

A. Roof Curbs: Internally reinforced roof-curb units capable of supporting superimposed live and dead loads, including equipment loads and other construction indicated on Drawings, bearing continuously on roof structure, and capable of meeting performance requirements; with welded or mechanically fastened and sealed corner joints, straight sides, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   a. Curbs Plus, Inc.
   b. Milcor; Commercial Products Group of Hart & Cooley, Inc.

B. Size: Coordinate dimensions with roughing-in information or Shop Drawings of equipment to be supported.

C. Material: Zinc-coated (galvanized) 0.079 inch (2.01 mm) thick.

1. Finish: Factory prime coating.

D. Construction:

1. Curb Profile: Manufacturer's standard unless alternative profile indicated on Drawings compatible with roofing system.
2. Fabricate curbs to minimum height of 8 inches above roofing surface unless otherwise indicated.
3. Top Surface: Level top of curb, with roof slope accommodated by sloping deck-mounting flange or by use of leveler frame.
4. Sloping Roofs: Where roof slope exceeds 1:48, fabricate curb with perimeter curb height tapered to accommodate roof slope so that top surface of perimeter curb is level. Equip unit with water diverter or cricket on side that obstructs water flow.
5. Insulation: Factory insulated with manufacturer's standard glass-fiber board insulation.
6. Platform Cap: Where portion of roof curb is not covered by equipment, provide weathertight platform cap formed from 3/4-inch (19-mm) thick plywood covered with metal sheet of same type, thickness, and finish as required for curb.
7. Metal Counterflashing: Manufacturer's standard, removable, fabricated of same metal and finish as curb.

2.5 ROOF HATCH

A. Roof Hatches: Metal roof-hatch units with insulated lids and insulated curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, straight sides, and integrally formed deck-mounting flange at perimeter bottom.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Bilco Company (The).
   b. Bristolite Daylighting Systems, Inc.
   c. Dur-Red Products.
   d. Milcor; Commercial Products Group of Hart & Cooley, Inc.
   e. O'Keeffe's Inc.

B. Type and Size: Single-leaf lid, 30 by 36 inches (750 by 900 mm), unless indicated otherwise on Drawings.

C. Hatch Material: Zinc-coated (galvanized) steel sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Factory prime coating

D. Hatch Material: Aluminum sheet.

1. Thickness: Manufacturer's standard thickness for hatch size indicated.
2. Finish: Mill.

E. Construction:

1. Insulation: Manufacturer's standard Cellulosic-fiber board, Glass-fiber board or Polyisocyanurate board.
2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
4. Fabricate curbs to minimum height of 12 inches above roofing surface unless otherwise indicated.
5. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate curb with perimeter curb height that is tapered to accommodate roof slope so that top surfaces of perimeter curb are level. Equip hatch with water diverter or cricket on side that obstructs water flow.

F. Hardware: Spring operators, hold-open arm, galvanized or stainless-steel spring latch with turn handles, galvanized or stainless-steel butt- or pintle-type hinge system, and padlock hasps inside and outside.

G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.

1. Height: 42 inches above finished roof deck.
2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches (31 mm) in diameter or galvanized-steel tube, 1-5/8 inches (41 mm) in diameter.
3. Flat Bar: Galvanized steel, 2 inches (50 mm) high by 3/8 inch (9 mm) thick.
4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches (533 mm) in diameter.
5. Chain Passway Barrier: Galvanized proof coil chain with quick link on fixed end.
6. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
7. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
8. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
9. Fabricate joints exposed to weather to be watertight.
10. Fasteners: Manufacturer's standard, finished to match railing system.
11. Finish: Manufacturer's standard.

H. Ladder-Assist Post: Roof-hatch manufacturer's standard device for attachment to roof-access ladder.

1. Operation: Post locks in place on full extension; release mechanism returns post to closed position.
2. Height: 42 inches above finished roof deck.
3. Material: Steel tube, galvanized, Stainless steel or Aluminum.
4. Post: 1-5/8-inch diameter pipe.
5. Finish: Manufacturer's standard.

2.6 SOFFIT VENTS

A. Screen Vent: Provide at canopy soffit as indicated on Drawings. Nail to canopy framing before plywood is installed.

1. Manufacturer: Fry Reglet Corporation, Anaheim, CA (800) 237-9773; www.fryreglet.com.
2. Product: Model No. PCS- 875-V-300.
3. Material: Extruded aluminum, allow 6063 T5; clear anodized finish.
4. Dimensions:
   a. Plaster Depth: 7/8 inch.
   b. Reveal Width: 3 inches.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Verify dimensions of roof openings for roof accessories. Install roof accessories according to manufacturer's written instructions.

1. Install roof accessories level; plumb; true to line and elevation; and without warping, jogs in alignment, buckling, or tool marks.
2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing roof accessories directly on cementitious or wood substrates, install a course of underlayment and cover with manufacturer's recommended slip sheet.

C. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

3.2 REPAIR AND CLEANING

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780/A 780M.

B. Touch up factory-primed surfaces with compatible primer ready for field painting according to Section 099113 "Exterior Painting."

C. Clean exposed surfaces according to manufacturer's written instructions.

D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 077200

SECTION 078100 - APPLIED FIREPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes sprayed fire-resistive materials.

1.2 DEFINITIONS

A. SFRM: Sprayed fire-resistive materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Evaluation reports.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Steel members are to be considered unrestrained unless specifically noted otherwise.

C. Asbestos: Provide products containing no detectable asbestos.

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MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
△		
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△		

TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002

DRAWN: EMQ CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

SP.3

SHEET OF

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

A. Sprayed Fire-Resistive Material: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Carboline Company; a subsidiary of RPM International.

b. GCP Applied Technologies Inc. (formerly Grace Construction Products).

c. Isolatek International.

2. Application: Designated for exterior use by a qualified testing agency acceptable to authorities having jurisdiction.

3. Bond Strength: Minimum 150-lbf/sq. ft. (7.18-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.

4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch (9 mm).

5. Combustion Characteristics: ASTM E 136.

6. Surface-Burning Characteristics: Comply with ASTM E 84.

a. Flame-Spread Index: 10 or less.

b. Smoke-Developed Index: 10 or less.

7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.

8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.

9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.

10. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. (0.270 g/sq. m) in 24 hours according to ASTM E 859.

11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in no growth on specimens per ASTM G 21 or rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273.

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by fireproofing manufacturer for the required fire-resistance design.

C. Bonding Agent: Product approved by fireproofing manufacturer.

D. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.

B. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.

3.3 APPLICATION

A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.

B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.

D. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage] a qualified special inspector to perform the following special inspections:

1. Test and inspect as required by the CBC, Subsection 1705.13, "Sprayed Fire-Resistant Materials."

B. Fireproofing will be considered defective if it does not pass tests and inspections.

1. Remove and replace fireproofing that does not pass tests and inspections, and retest.

2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

C. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

B. Repair fireproofing damaged by other work before concealing it with other construction.

C. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078100

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

2. Nonstaining silicone joint sealants.

3. Urethane joint sealants.

4. Immersible joint sealants.

5. Mildew-resistant joint sealants.

6. Latex joint sealants.

7. Preformed joint sealants.

8. Acoustical joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples: For each kind and color of joint sealant required.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.

2. Joint-sealant manufacturer and product name.

3. Joint-sealant formulation.

4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Preconstruction laboratory test reports.

C. Preconstruction field-adhesion-test reports.

D. Field-adhesion-test reports.

E. Sample warranties.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: **Two** years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: **Five** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24), or as required to comply with the requirements of the current edition of the California Green Building Standards Code – Nonresidential.

1. Architectural Sealants: 250 g/L.

2. Sealant Primers for Nonporous Substrates: 250 g/L.

3. Sealant Primers for Porous Substrates: 775 g/L.

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

D. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

E. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

F. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

G. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 Articles by one of the following manufacturers:

1. Bostik, an Arkema Company

2. Dow Corning Corporation

3. GE Advanced Materials.

4. Pecora Corporation; [301 NS] [311 NS] [890] [890FTS].

5. Sika Corporation, Construction Products Division; SikaSil-C990.

6. Sonneborn, Division of ChemRex Inc., Shakopee, MN (800) 243-6739; www.chemrex.com.

7. Tremco Incorporated;

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Multi-component Non-sag Polysulfide Sealant: Type M, Grade NS, Class 25, Use NT.

1. Products:

a. Pacific Polymers, Inc.; Elasto-Seal 227 Type II (Gun Grade).

b. Pecora Corporation; Synthacalk GC-2+.

c. Sonneborn, Division of ChemRex Inc.; Sonolastic Polysulfide Sealant.

2. Exterior Applications: Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:

a. Control and expansion joints in unit masonry.

b. Joints between pre-cast architectural concrete units.

c. Construction joints in cast-in-place concrete.

C. Low-Modulus Single-Component Neutral-Curing Nonsag Silicone Sealant: Type S, Grade NS, Class 50 or 100/50, Use NT.

1. Products:

a. Dow Corning; 790.

b. GE Silicones; SilPruf SCS2000.

c. Pecora Corporation; 864 or 890.

d. Sonneborn, Division of ChemRex Inc.; Omniseal.

e. Tremco; Spectrem 3.

2. Exterior Applications: Exterior joints in the following vertical surfaces and horizontal non-traffic surfaces:

a. Joints between metal panels.

b. Perimeter joints between concrete or masonry and frames of doors, windows, and louvers.

c. Joints between different concrete or masonry materials.

3. Interior Applications: Interior joints in the following vertical surfaces and horizontal non-traffic surfaces:

a. Control and expansion joints on exposed interior surfaces of exterior walls.

b. Perimeter joints between interior wall surfaces and frames of interior doors and

D. Ultralow-Modulus Single-Component Neutral-Curing Pourable Sillcone Sealant: Type,Grade P, Class 100/50, Use T.

1. Products:

a. Dow Corning Corporation; 890-SL.

b. Pecora Corporation; 300 Pavement Sealant.

2. Exterior Applications: Exterior joints in the following horizontal traffic surfaces:

a. Isolation and contraction joints in cast-in-place concrete slabs.

E. Single-Component Mildew-Resistant Silicone Sealant: Type S, Grade NS, Class 25, Use NT.

1. Products:

a. Dow Corning Corporation; 786 Mildew Resistant.

b. GE Silicones; Sanitary SCS1700.

c. Pecora Corporation; 898 Silicone Sanitary Sealant.

d. Tremco; Tremsil 200 White or Tremsil 600 White.

2. Interior Applications: Interior joints in the following vertical surfaces and horizontal non-traffic surfaces:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.

F. Single-Component Non-sag Urethane Sealant: Type S, Grade NS, Class 25, Use NT.

1. Products:

a. Bostik Findley; Chem-Calk 900.

b. Pacific Polymers, Inc.; Elasto-Thane 230.

c. Pecora Corporation; Dynatrol I-XL.

d. Tremco; DyMonic.

2. Exterior Applications: Exterior joints in the following vertical and horizontal non-traffic surfaces:

a. Joints between metal panels.

b. Perimeter joints between concrete or masonry and frames of doors, windows, and louvers.

c. Joints between different concrete or masonry materials.

3. Interior Applications:

a. Vertical expansion and control joints.

G. Multi-component, Non-sag Urethane Sealants: Type M, Grade NS, Class 25, Use NT.

1. Products:

a. Bostik Findley; Chem-Calk 500.

b. Pacific Polymers, Inc.; Elasto-Thane 227 Type II (Gun Grade).

c. Tremco; Dymeric.

2. Exterior Applications: Exterior joints in the following vertical and horizontal non-traffic surfaces:

a. Joints between metal panels.

b. Perimeter joints between concrete or masonry and frames of doors, windows, and louvers.

c. Vertical expansion and control joints.

3. Interior Applications:

a. Vertical expansion and control joints.

H. Multi-component Pourable Urethane Sealants: Type M, Grade P, Class 25, Shore A hardness 35, self-leveling, Use T.

1. Products:

a. Bostik Findley; Chem-Calk 550.

b. Pacific Polymers, Inc.; Elasto-Thane 227 Type I (Self Leveling).

c. Pecora Corporation; Urexpan NR-200.

d. Tremco; THC-900 or THC-901.

2. Interior Applications: Interior joints in the following horizontal traffic surfaces:

a. Isolation and contraction joints in cast-in-place concrete slabs.

2.4 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

1. Products:

a. Pecora Corporation; BA-98.

b. Tremco; Tremco Acoustical Sealant.

2.5 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), unless otherwise recommended by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

1. Product: Sonneborn, Division of ChemRex Inc.; Closed-Cell Backer Rod.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove laitance and form-release agents from concrete.

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.

2. Completely fill recesses in each joint configuration.

3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes:

1. Interior standard steel doors and frames.

2. Exterior standard steel doors and frames.

3. Pre-finished interior aluminum door frames.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.

2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.

3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

4. Details and locations of reinforcement and preparations for hardware.

5. Details of each different wall opening condition.

6. Details of anchorages, accessories, joints, and connections.

C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.6 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Hollow Metal Doors and Frames: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Ceco Door; ASSA ABLOY.

2. Republic Doors and Frames.

3. Steelcraft; an Allegion brand.

B. Interior Aluminum Wood Door Frames: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Western Integrated Materials, Inc., Long Beach, CA (562) 634-2823

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings[and temperature-rise limits] indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide assemblies with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

C. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than [0.50 deg Btu/F x h x sq. ft. (2.84 W/K x sq. m)] [0.40 deg Btu/F x h x sq. ft. (2.27 W/K x sq. m)] [0.38 deg Btu/F x h x sq. ft. (2.16 W/K x sq. m)] <Insert U-factor> when tested according to ASTM C 518.

2.3 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Standard-Duty Doors and Frames: SDI A250.8, Level 1; SDI A250.4, Level C. At locations indicated in the Door and Frame Schedule.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.

b. Thickness: 1-3/4 inches.

c. Face: Uncoated, (Metallic-coated where indicated) steel sheet, minimum thickness of 0.032 inch.

d. Edge Construction: Model 1, Full Flush.

e. Core: Manufacturer's standard

f. Fire-Rated Core: Manufacturer's standard as required for fire-rated protection ratings indicated.

2. Frames:

a. Materials: Uncoated, (Metallic-coated where indicated) steel sheet, minimum thickness of 0.042 inch.

b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.

c. Construction: Face welded, Full profile welded.

C. Heavy-Duty Doors and Frames: SDI A250.8, Level 2; SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.

b. Thickness: 1-3/4 inches (44.5 mm).

c. Face: Uncoated, (Metallic-coated where indicated) steel sheet, minimum thickness of 0.042 inch

d. Edge Construction: Model 1, Full Flush.

e. Core: Manufacturer's standard.

f. Fire-Rated Core: Manufacturer's standard as required for fire-rated protection ratings indicated.

2. Frames:

a. Materials: Uncoated (Metallic-coated where indicated) steel sheet, minimum thickness of 0.053 inch (1.3 mm).

b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.

c. Construction: Face welded, Full profile welded.

2.4 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2; SDI A250.4, Level B.

1. Doors:

a. Type: As indicated in the Door and Frame Schedule.

b. Thickness: 1-3/4 inches.

c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.

d. Edge Construction: Model 1, Full Flush.

e. Edge Bevel: Bevel lock and hinge edges 1/8 inch in 2 inches unless square edge is indicated.

f. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.

g. Bottom Edges: Close bottom edges of doors with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.

h. Core: Manufacturer's standard.

i. Fire-Rated Core: Manufacturer's standard as required for fire-rated protection ratings indicated.

2. Frames:

a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum [A40 (ZF120)] [A60 (ZF180)]coating.

b. Construction: Face welded, Full profile welded.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.

2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).

3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M; hot-dip galvanized according to ASTM A 153/A 153M, Class B.

2.6 DOOR LOUVERS

A. Manufacturers:

1. Air Louvers Inc., Commerce, CA (800) 766-0660.

2. Anemostat Door Products, Carson, CA (213) 775-7741.

3. Construction Specialties, Inc., Cranford, NJ (800) 631-7379.

B. Louvers:

1. Blade Types:

a. Stationary inverted V blade, vision proof, 1-inch depth.

b. Install adjustable type with spring closer and 135 deg F fusible link where required.

2.7 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Aluminum: Controlled alloy billets of 6063T5, to assure compliance with tight dimensional tolerances and maintain color uniformity.

G. Glazing: Comply with requirements in Section 088000 "Glazing."

2.8 EXTRUDED INTERIOR ALUMINUM FRAMES:

A. Western Integrated Material Series as indicated on Drawings.

2.9 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding, or by rigid mechanical anchors.

2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.

3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.

b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

D. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Provide stops and moldings flush with face of door, and with beveled stops unless otherwise indicated.

2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.

4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

2.10 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer for field painting.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.11 INTERIOR ALUMINUM FRAME FINISHES

A. Factory finish extruded frame and door components so that any part exposed to view upon completion of installation will be uniform in finish and color.

B. Acrylic Finish: Comply with AAMA 603.5 baked to assure hardness.

1. Color: As selected by Architect from manufacturer's standard colors.

C. Clear anodic coating: Comply with AAMA 607.1.

1. Commercial, AAM12C22A21 clear anodized coating, 0.1 mill minimum thickness.

D. Color anodic coating: Comply with AAMA 608.1.

1. Class II, AAM12C22A34 color coating electrolytically deposited, 0.4 mill minimum thickness.

2. Color: As selected by Architect from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of standard steel doors and frames.

1. Examine roughing-in for embedded and built-in anchors to verify actual locations of standard steel frame connections before frame installation.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. Hollow-Metal Frames: Comply with SDI A250.11.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.

b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames according to NFPA 80.

3. Floor Anchors: Secure with postinstalled expansion anchors.

a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

4. Solidly pack mineral-fiber insulation inside frames.

5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors

7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.

c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

B. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with SDI A250.8.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3. Smoke-Control Doors: Install doors according to NFPA 105.

C. Interior Aluminum Frames: Comply with frame manufacturer's printed installation instructions and approved shop drawings. Strictly adhere to maintaining specified wall thickness to insure dimension does not exceed frame throat size specified.

C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

3.4 CLEANING AND TOUCHUP

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer.

2. Factory finishing flush wood doors.

3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.

2. Dimensions and locations of mortises and holes for hardware.

3. Dimensions and locations of cutouts.

4. Undercuts.

5. Requirements for veneer matching.

6. Doors to be factory finished and finish requirements.

7. Fire-protection ratings for fire-rated doors.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.

b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ampco Products, LLC.

2. Eggers Industries.

3. Mohawk Flush Doors, Inc.

4. VT Industries Inc.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards

1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.

B. WDMA I.S.1-A Performance Grade:

1. Heavy Duty unless otherwise indicated.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.

2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

E. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD- or Grade LD-2, made with binder containing no urea-formaldehyde.

2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

F. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

a. Screw Withdrawal, Face: 700 lbf (3100 N).

b. Screw Withdrawal, Edge: 400 lbf (1780 N).

G. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.

2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.

3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom (Grade A faces).

2. Species: Anigre, or as indicated on Drawings.

3. Cut: Plain sliced (flat sliced).

4. Match between Veneer Leaves: Book match.

5. Assembly of Veneer Leaves on Door Faces: Running match.

6. Pair and Set Match: Provide for doors hung in same opening.

7. Core: Either Particleboard, Glued wood stave or Structural composite lumber.

8. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.

2.4 LIGHT FRAMES AND LOUVERS

A. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- (1.2-mm-) thick, cold-rolled steel sheet; factory primed for paint or with baked-enamel- or powder-coated finish; and approved for use in doors of fire-protection rating indicated.

B. Metal Louvers:

1. Metal and Finish: Hot-dip galvanized steel, 0.040 inch (1.0 mm) thick, [factory primed for paint or with baked-enamel- or powder-coated finish.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.

2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

3. Louvers: Factory install louvers in prepared openings.

2.6 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on [top and] bottom edges, edges of cutouts, and mortises.

B. Factory finish doors that are indicated to receive transparent finish.

C. Transparent Finish:

1. Grade: Custom.

2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 5, conversion varnish, System 9, UV curable, acrylated epoxy, polyester, or urethane, System 10, UV curable, water based or System 11, catalyzed polyurethane per manufacturer's standard.

3. Staining: As selected by Architect from manufacturer's full range.

4. Sheen: Satin or Semigloss as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.

2. Install smoke- and draft-control doors according to NFPA 105.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Storefront framing.

2. Manual-swing entrance doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

C. Samples: For each type of exposed finish required.

D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

B. Product test reports.

C. Source quality-control reports.

D. Field quality-control reports.

E. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

C. Perform Work in accordance with AAMA SFM1 and manufacturer's written instructions.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, licensed in the state of California, to design aluminum-framed entrances and storefronts.

B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Failure also includes the following:

a. Thermal stresses transferring to building structure.

b. Glass breakage.

c. Noise or vibration created by wind and thermal and structural movements.

d. Loosening or weakening of fasteners, attachments, and other components.

e. Failure of operating units.

C. Structural Loads:

1. Wind Loads: As indicated on Drawings, and/or required by local codes as determined by delegated design engineer.

2. Other Design Loads: As indicated on Drawings, and/or required by local codes as determined by delegated design engineer.

D. Deflection of Framing Members: At design wind pressure, as follows, and/or required by local codes as determined by delegated design engineer.

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding 1/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.

2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.

a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:

a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 11 feet 8-1/4 inches (3.6 m) or 1/175 times span, for spans of less than 11 feet 8-1/4 inches (3.6 m).

E. Structural: Test according to ASTM E 330/E 330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.

2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.

3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:

a. Maximum air leakage of 0.06 cfm/sq. ft. through fixed light areas of storefront at a static-air-pressure differential of 6.24 lbf/sq. ft..

2. Entrance Doors:

a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.

H. Energy Performance: Comply with requirements of current version of California Green Building Standards Code – Nonresidential. Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor of not more than 0.27 Btu/sq. ft. x h x deg F (2.33 W/sq. m x K) as determined according to NFRC 100.

2. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have SHGC of no greater than 0.32 as determined according to NFRC 200.

3. Condensation Resistance: Fixed glazing and framing areas as a system shall have an NFRC-certified condensation resistance rating of no less than 45 as determined according to NFRC 500.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 STOREFRONT SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide the following product or approved equal.

1. Manufacturer: Oldcastle BuildingEnvelope™, Terrell, TX..

2. Storefront Framing System: "Series 3000 Thermal MultiPane", glass set to the front, thermally broken, exterior loaded 2" x 4-1/2" mullion profile.

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Exterior Framing Construction: Thermally broken.

2. Glazing System: Retained mechanically with gaskets on four sides.

3. Finish: Clear anodic finish, or as indicated on Drawings.

4. Fabrication Method: Field-fabricated stick system.

5. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

6. Steel Reinforcement: As required by manufacturer.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 ENTRANCE DOOR SYSTEMS

A. Basis-of-Design Product: Subject to compliance with requirements, provide the following product or approved equal.

1. Manufacturer: Oldcastle BuildingEnvelope™, Terrell, TX..

2. Entrance Doors: Standard duty systems (0.125" (3.17mm) wall thickness; 2-5/8" (66.67mm) deep): Model AD-375 - medium stile thermal, (10" bottom rail, 2-1/2" top rail, 3-3/4" verticals)

B. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

1. Door Construction: 2-5/8-inch overall thickness, with minimum 0.125-inch- (3.2-mm-)] thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: Manufacturer's standard high-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior] <Insert description.

2. Door Design: Medium stile; 3-3/4-inch (88.9-mm) nominal width.

3. Glazing Stops and Gaskets: [Beveled] [Square] <Insert description>, snap-on, extruded-aluminum stops and preformed gaskets.

a. Provide nonremovable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

A. General: Provide entrance door hardware and entrance door hardware sets indicated on the Hardware Schedule on the Drawings for each entrance door, to comply with requirements in this Section.

1. Provide products complying with BHMA standard referenced.

2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

3. Opening-Force Requirements:

a. Accessible Interior and Exterior Doors: Not more than 5 lbf (22.2 N) to fully open door.

b. Fire Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width, or as required by local codes.

B. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in Hardware Schedule on Drawings.

C. Cylinders: As indicated on Hardware Schedule on the Drawings.

D. Continuous-Gear Hinges: BHMA A156.26.

E. Mortise Auxiliary Locks: BHMA A156.5, Grade 1.

F. Operating Trim: BHMA A156.6.

G. Closers: BHMA A156.4, Grade 1, with accessories required for a complete installation, sized as required by door size, exposure to weather, and anticipated frequency of use; adjustable to comply with field conditions and requirements for opening force.

H. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.

I. Weather Stripping: Manufacturer's standard replaceable components.

J. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

K. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (12.7 mm).

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets:

1. Manufacturer's standard compression type design, replaceable, molded or extruded, silicone, or ethylene propylene diene monomer (EPDM).

2. Profile and hardness as required, to maintain uniform pressure for watertight seal.

C. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

D. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

A. Aluminum:

1. ASTM B221, alloy 6063-T6 for extrusions; ASTM B209, alloy 5005-H16 for sheets; or other alloys and temper recommended by manufacturer appropriate for specified finish.

B. Fasteners:

1. Aluminum, non-magnetic stainless steel or other non-corrosive materials compatible with items being fastened.

2. Provide concealed fasteners wherever possible.

3. For exposed locations, provide Phillips flathead screws with finish matching item fastened.

4. For concealed locations, provide manufacturer's standard fasteners.

C. Expansion Anchor Devices: Lead-shield or toothed-steel, drilled-in, expansion bolt anchors.

D. Protective Coatings: Cold-applied asphalt mastic complying with SSPC-Paint 12, compounded for 30 mil thickness for each coat; or alkyd type zinc chromate primer complying with FS TT-P-645.

E. Touch-Up Primer for Galvanized Components: Zinc oxide conforming to FS TT-P-641.

F. Thermal separation consisting of extruded glass reinforced Polyamide.

G. Dual Weather-stripping:

1. Provide Bulb gasket full perimeter of frame

2. Provide EPDM or silicone gasket weather-stripping in bottom & top door rail, for contact with threshold and door header.

3. Provide EPDM extruded gasket at jambs and door header.

4. Provide pile weather exterior and dual bulb weathering at interior of adjustable astragals on pairs of doors.

2.7 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.

2. Accurately fitted joints with ends coped or mitered.

3. Physical and thermal isolation of glazing from framing members.

4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

5. Provisions for field replacement of glazing from exterior.

6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

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MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002

DRAWN: EMQ CHECKED: MII

SCALE: AS NOTED DATE: 04-19-23

SP.4

SHEET OF

G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.
1. Color: As selected by Architect from full range of industry colors and color densities.

C. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF or FEVE resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure non-movement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal perimeter and other joints watertight unless otherwise indicated.

B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

D. Install components plumb and true in alignment with established lines and grades.

E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

F. Install glazing as specified in Section 088000 "Glazing."

G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.2 ENTRANCE DOOR HARDWARE SETS

A. See Hardware Schedule on the Drawings.

END OF SECTION 084113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Mechanical door hardware for the following:
    a. Swinging doors.
2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For electrified door hardware.
1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Samples: For each exposed product in each finish specified.

D. Door hardware schedule.

E. Keying schedule.

F. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Submittal Sequence: Submit door hardware schedule [after] [or] [concurrent with] submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format [and use same door numbers] as in the Contract Documents.
3. Content: Include the following information:
    a. Identification number, location, hand, fire rating, size, and material of each door and frame.
    b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
    c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
    d. Retain first subparagraph below for electrified door hardware.
    e. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
    f. Fastenings and other pertinent information.
    g. Explanation of abbreviations, symbols, and codes contained in schedule.
    h. Mounting locations for door hardware.
    i. List of related door devices specified in other Sections for each door and frame.
4. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.
1. Scheduling Responsibility: Preparation of door hardware and keying schedule.

B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as an Architectural Hardware Consultant (AHC)

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
1. Air Leakage Rate: Maximum air leakage of [0.3 cfm/sq. ft. (3 cu. m per minute/sq. m)] <Insert rate> at the tested pressure differential of [0.3-inch wg (75 Pa)] <Insert value> of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 5 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with '2016 California Building Code (CBC)" Accessibility requirements and the DOJ's "2010 ADA Standards for Accessible Design".

2.2 SCHEDULED DOOR HARDWARE

A. Provide products for each door that comply with requirements indicated in Part 2 and door hardware schedule on the Drawings.

2.3 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

B. Hinge Base Metal: Unless otherwise indicated, provide the following:
1. Exterior Hinges: Stainless steel, with stainless-steel pin.
2. Interior Hinges: Steel, with steel pin.
3. Hinges for Fire-Rated Assemblies: Steel, with steel pin.

C. Ball-Bearing Butts:
1. Standard: BHMA A156.1, Grade 1.
2. Provide non-removable pins at hinges exposed to outside of door.
3. Provide nonferrous hinges where hinges are exposed to weather.
4. Quantities:
    a. For doors with heights up to 87 inches, provide 3 hinges per leaf.
    b. For doors with heights of greater than 87 and up to 120 inches, provide 4 hinges per leaf.

2.4 CONTINUOUS HINGES

A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch- (3.0-mm-) thick, hinge leaves with minimum overall width of 4 inches (102 mm); fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.

B. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.

2.5 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: As indicated in door hardware schedule.

B. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:
1. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
2. Mortise Locks: Minimum 3/4-inch (19-mm) latchbolt throw.
3. Deadbolts: Minimum [1-inch (25-mm)] [1.25-inch (32-mm)] <Insert dimension> bolt throw.

C. Lock Backset: 2-3/4 inches (70 mm) unless otherwise indicated.

D. Lock Trim:
1. Description: As indicated on Drawings
1. Levers: As indicated on Drawings
2. Escutcheons (Roses): As indicated on Drawings
3. Dummy Trim: Match lever lock trim and escutcheons.

E. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.

F. Bored Locks: BHMA A156.2; [Grade 1] [Grade 2]; Series 4000.

G. Mortise Locks: BHMA A156.13; [Operational Grade 1] [Security Grade 1] [Operational Grade 2] [Security Grade 2]; stamped steel case with steel or brass parts; Series 1000.

2.6 AUXILIARY LOCKS

A. Bored Auxiliary Locks: BHMA A156.36: [Grade 1] [Grade 2]; with strike that suits frame.

B. Mortise Auxiliary Locks: BHMA A156.36; [Grade 1] [Grade 2]; with strike that suits frame.

C. Push-Button Combination Locks: BHMA A156.36; cylindrical; Grade 1; lock opens by entering a

2.7 ELECTRIC STRIKES

A. Electric Strikes: BHMA A156.31; [Grade 1] [Grade 2]; with faceplate to suit lock and frame.

2.8 ELECTROMAGNETIC LOCKS

A. Electromagnetic Locks: BHMA A156.23; electrically powered; with electromagnet attached to frame and armature plate attached to door; full-exterior or full-interior type, as required by application indicated.

2.9 ELECTROMECHANICAL LOCKS

A. Electromechanical Locks: BHMA A156.25; [Grade 1] [Grade 2]; motor or solenoid driven; with strike that suits frame.
1. Type: Bored, Mortise latchbolt, Mortise deadbolt, or Mortise deadlocking latchbolt as indicated on Hardware Schedule on Drawings.

2.10 SELF-CONTAINED ELECTRONIC LOCKS

A. Self-Contained Electronic Locks: BHMA A156.25, [bored] [mortise]; with internal, battery-powered, self-contained electronic locks; consisting of complete lockset, motor-driven lock mechanism, and actuating device; enclosed in zinc-dichromate-plated, wrought-steel case, and strike that suits frame. Provide key override, low-battery detection and warning, LED status indicators, and ability to program at the lock.

2.11 EXIT LOCKS AND EXIT ALARMS

A. Exit Locks and Alarms: BHMA A156.29, Grade 1.

B. Exit Locks: BHMA A156.29, Grade 1, surface mounted, battery powered, housed in metal case; with red-and-white lettering reading: EMERGENCY EXIT PUSH TO OPEN-ALARM WELL SOUND.

C. Stand-Alone Exit Alarms: BHMA A156.29, Grade 1, surface mounted on door.

2.12 SURFACE BOLTS

A. Surface Bolts: BHMA A156.16.

2.13 MANUAL FLUSH BOLTS

A. Manual Flush Bolts: BHMA A156.16; minimum 3/4-inch (19-mm) throw; designed for mortising into door edge.

2.14 AUTOMATIC AND SELF-LATCHING FLUSH BOLTS

A. Automatic and Self-Latching Flush Bolts: BHMA A156.16; minimum 3/4-inch (19-mm) throw; designed for mortising into door edge.[Include wear plates.]

2.15 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3.

B. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG).
1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lb force.

C. Exit Devices for Means of Egress Doors: Comply with NFPA 101, Exit devices shall not require more than 5 lb force to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

E. Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Fire labeled doors shall not require more than 15 lb force.

2.16 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver

B. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

C. High-Security Lock Cylinders: BHMA A156.30; Grade 1 permanent cores that are removable; face finished to match lockset.

D. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

E. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.17 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock.
1. Master Key System: Change keys and a master key operate cylinders.
    a. Provide three cylinder change keys and five master keys.
2. Keyed Alike: Key all cylinders to same change key.

B. Keys: Nickel silver
1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
    a. Notation: "DO NOT DUPLICATE."

2.18 KEY CONTROL SYSTEM

A. Key Control Cabinet: BHMA A156.28; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

2.19 OPERATING TRIM

A. Operating Trim: To match door hardware.

2.20 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release[; and with internal override].

B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

C. Astragals: BHMA A156.22.

2.21 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.22 CONCEALED CLOSERS

A. Concealed Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

2.23 CLOSER HOLDER RELEASE DEVICES

A. Closer Holder Release Devices: BHMA A156.15; Grade 1; closer connected with separate or integral releasing and fire- or smoke-detecting devices. Door shall become self-closing on interruption of signal to release device. Automatic release is activated by [smoke detection system] [loss of power].

2.24 MECHANICAL STOPS AND HOLDERS

A. Wall- and Floor-Mounted Stops: BHMA A156.16.

2.25 ELECTROMAGNETIC STOPS AND HOLDERS

A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; [wall-mounted electromagnetic single] [floor-mounted electromagnet single] [floor-mounted electromagnet double] unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

2.26 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

2.27 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

B. Maximum Air Leakage: When tested according to ASTM E 283 with tested pressure differential of 0.3-inch wg (75 Pa), as follows:
1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) of door opening.
3. Gasketing on Double Doors: 0.50 cfm per foot (0.000774 cu. m/s per m) of door opening.

C. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
1. Test Pressure: Test at atmospheric pressure.

2.28 THRESHOLDS

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG) and CBC 2016 Accessibility requirements.
1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum: 1/2 inch high.

2.29 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- (1.3-mm-) thick stainless steel]; with manufacturer's standard machine or self-tapping screw fasteners.

2.30 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
2. Fire-Rated Applications:
    a. Wood or Machine Screws: For the following:
        1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
        2) Strike plates to frames.
        3) Closers to doors and frames.
    b. Steel Through Bolts: For the following unless door blocking is provided:
        1) Surface hinges to doors.
        2) Closers to doors and frames.
        3) Surface-mounted exit devices.
3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.

2.31 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in Door Hardware Schedule.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated on Drawings, or as required to comply with the following, unless otherwise indicated or required to comply with governing regulations.
1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work. Do not install surface-mounted items until finishes have been completed on substrates involved.
1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Lock Cylinders: Install construction cores to secure building and areas during construction period.
1. Replace construction cores with permanent cores as directed by Owner.
2. Furnish permanent cores to Owner for installation.

E. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect.
1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.

G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 079200 "Joint Sealants."

H. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
1. Do not notch perimeter gasketing to install other surface-applied hardware.

J. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.3 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner may engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.4 ADJUSTING

A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.5 DOOR HARDWARE SCHEDULE (See Drawings for Door Hardware Schedule)

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
1. Glass for windows, doors, storefront framing.
2. Glazing sealants and accessories.

1.2 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Preconstruction adhesion and compatibility test report.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

B. Source Limitations for Glass: Obtain ultraclear float glass, tinted float glass, coated float glass laminated glass and insulating glass from single source from single manufacturer for each glass type.

C. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

D. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: GANA's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

E. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

F. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

G. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.8 WARRANTY

A. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified, professional engineer, licensed in the state of California, to design glazing.

B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the current edition of the California Building Code and ASTM E 1300.
1. Design Wind Pressures: As indicated on Drawings, and/or required by local codes as determined by delegated design engineer.
2. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
2. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass[as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.3 GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.

B. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3 unless otherwise indicated.

C. Ultraclear Float Glass: ASTM C 1036, Type I, Class I (clear), Quality-Q3; and with visible light transmission of not less than 91 percent[and solar heat gain coefficient of not less than 0.87].

D. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.

E. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

F. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

G. Storefront Glazing: Subject to compliance with requirements, provide the following or approved equal:
1. PPG Industries, Inc.: Solarban XL (2) Optigray + Clear
    a. U-value: As indicated on Drawings.

H. Storefront Spandrel Glazing: Subject to compliance with requirements, provide the following or approved equal: ICD High Performance Coatings, 13911 NW 3rd CT, Vancouver, WA 98685, USA.
1. OPACI-COAT-300® spandrel glazing for monolithic and insulated glass applications PPG Industries, Inc:
    a. Color: to match storefront "Optigray + Clear" glazing
    b. U-value: As indicated on Drawings.

2.4 LAMINATED GLASS

A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
1. Construction: Laminate glass with polyvinyl butyral interlayer, ionomeric polymer interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

2.5 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
1. Sealing System: Dual seals.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction.
3. U-value: As indicated on Drawings.

2.6 GLAZING SEALANTS

A. General:
1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    a. Dow Corning Corporation; 790.
    b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
    c. Pecora Corporation; 890.
    d. Tremco Incorporated; Spectrem 1.
2. Applications: Where indicated and cap beads.

C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    a. Dow Corning Corporation; 791 795 995.
    b. GE Advanced Materials - Silicones; SilPruf SCS2000 UltraPruf II SCS2900.
    c. Pecora Corporation; 864 895 898.
    d. Tremco Incorporated; Spectrem 2
2. Applications: Where indicated; exterior structural glazing; and exterior sills, jambs, and heads of window frames having insulating glass.

D. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
    a. Dow Corning Corporation; 799.
    b. GE Advanced Materials - Silicones; UltraGlaze SSG4000, UltraGlaze SSG4000AC.
    c. Tremco Incorporated; Proglaze SSG, Tremsil 600.
2. Applications: Where indicated; exterior structural glazing; and exterior sills, jambs, and heads of window frames having insulating glass.

E. Glazing Sealant: Acid-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    a. Dow Corning Corporation; 999-A.
    b. GE Advanced Materials - Silicones; Contractors SCS1000, Construction SCS1200.
    c. Pecora Corporation; 860.
    d. Tremco Incorporated; Proglaze, Tremsil 200.
2. Applications: Where indicated; on non-porous surfaces and cap beads.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.9 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.

C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

A. Immediately after installation remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

END OF SECTION 088000

SECTION 092400 - CEMENT PLASTERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Exterior vertical plasterwork (stucco).
2. Exterior horizontal plasterwork (stucco).

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of finish coat indicated and for each color and texture specified.
1. Samples to be 24" x 24" on rigid backing.

1.3 QUALITY ASSURANCE

A. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Install mockups for each type of finish indicated.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.5 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Exterior Plasterwork:
1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 deg F (4.4 deg C).
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E 119 by a qualified testing agency.
1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 METAL LATH

A. Expanded-Metal Lath: ASTM C 847, cold-rolled carbon-steel sheet with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.
1. Diamond-Mesh Lath: Self-furring, [2.5 lb/sq. yd. (1.4 kg/sq. m)] [3.4 lb/sq. yd. (1.8 kg/sq. m)].

B. Wire-Fabric Lath:
1. Welded-Wire Lath: ASTM C 933; self-furring, 1.4 lb/sq. yd. (0.8 kg/sq. m)

C. Paper Backing: FS UU-B-790a, Type I, Grade D, Style 2 vapor-permeable paper.
1. Provide paper-backed lath unless otherwise indicated.
2. Building Paper - Kraft Waterproof Building Paper:
    a. Plywood Sheathing: 2 layers Grade D.

2.3 ACCESSORIES

A. General: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:
1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.
3. External- (Outside-) Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized-zinc coating.
4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.
    a. Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
8. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6 to 16 mm) wide; with perforated flanges.

2.4 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.

C. Additives and Admixtures: Exterior cement plaster, except finish coat, shall contain 1 pint of integral waterproofing per sack of cement.
1. Product: Sikamix 198 Sika Red Label; Sika Corporation, Lyndhurst, NJ (201) 933-8800; Santa Fe Springs, CA (562) 941-0231.

D. Bonding Compound: ASTM C 932.

E. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

F. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.

G. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21-mm) diameter unless otherwise indicated.

E. Isolation Strip at Exterior Walls
1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), unperforated.
2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

2.5 PLASTER MATERIALS

A. Portland Cement: ASTM C 150/C 150M, Type I.
1. Color for Finish Coats: White, unless noted otherwise on Drawings.

B. Colorants for Job-Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color to match Architect's sample.

C. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

D. Sand Aggregate: ASTM C 897.
1. Aggregate for Finish Coats: Clean white silica sand, graded as follows:
    a. Fine Sand Float Finishes: No. 30 sieve size.
    b. Coarse Sand Float Finishes: No. 20 or No. 16 sieve size or a combination.
    c. Dash Finishes: No. 12 to No. 20 sieve size, depending on the coarseness desired.

E. Ready-Mixed Finish-Coat Plaster: Mill-mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
1. Manufacturer: Omega Products International, Inc., Corona, CA (800) 600-6634; www. omega-products .com.
2. Product: Color Tek Exterior Stucco.
    a. Color: As indicated on Drawings.

2.6 ARCHITECTURAL FOAM SHAPES

A. Conform to ASTM C 578, type I and manufacturer's requirements for molded expanded polystyrene.
1. Minimum Thickness: 3/4 inch.
2. Flame Spread: Less than 25.
3. Cured: Aged by air drying for at least 6 weeks or equivalent kiln-dried process.
4. Maximum Size: 2 feet by 4 feet.

B. Shapes: Provide unfinished cornice moldings where indicated on Drawings to be coated with plaster.

C. Reinforcing Mesh: As recommended by foam shape manufacturer.

D. Base Coat and Adhesive: As recommended by foam shape manufacturer.

E. Mechanical Fasteners: Corrosion-resistant fasteners suitable for substrate as recommended by foam shape manufacturer.

F. Metal Insert: Provide foam shapes with Styro-loc 24 gage galvanized metal inserted continuous and 16-gage 2-inch straps no more than 24 inches o.c.
1. Manufacturer: Foam Concepts, Inc.

G. Manufacturers: Omega Products International, Inc., Corona, CA (800) 600-6634; www.omegaproducts.com.

2.7 PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.
1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:
1. Portland Cement Mixes:
    a. Scratch Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.
    b. Brown Coat: For cementitious material, mix 1 part portland cement and 0 to 3/4 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Base-Coat Mixes for Use over Unit Masonry and Concrete: Single base (scratch) coat for two-coat plasterwork on low-absorption plaster bases as follows:
1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 0 to 3/4 part lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

D. Base-Coat Mixes for Use over Unit Masonry and Concrete: Single base (scratch) coat for two-coat plasterwork on high-absorption plaster bases as follows:
1. Portland Cement Mix: For cementitious material, mix 1 part portland cement and 3/4 to 1-1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

E. Factory-Prepared Finish-Coat Mixes: For ready-mixed finish-coat plasters, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid-surface plaster bases that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLATION, GENERAL

A. Prepare smooth, solid substrates for plaster according to ASTM C 926.

B. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

3.3 INSTALLING METAL LATH

A. Metal Lath: Install according to ASTM C 1063.

3.4 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External (Outside) Corners:
1. Install lath-type, external-corner reinforcement or cornerbead at exterior locations.

C. Control Joints: Install control joints at locations indicated on Drawings, or if not indicated, in specific locations approved by Architect for visual effect complying with the following:
1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
    a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
    b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.
3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
4. Where control joints occur in surface of construction directly behind plaster.
5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

D. Seismic Stresses: After attachment of metal lath to horizontal wood supports, drive home a 5/8-inch-wide, 1-1/2-inch-long No. 9-gage ring shank hook staple over a l0d nail placed against face of lath not more than 3 inches from edge of each sheet. Space staples at not more than 27-inch intervals on every joist.

3.5 PLASTER APPLICATION

A. General: Comply with ASTM C 926.
1. Do not deviate more than plus or minus 1/4 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.
2. Grout hollow-metal frames, bases, and similar work occurring in plastered areas, with base-coat plaster material, before lathing where necessary. Except where full grouting is indicated or required for fire-resistance rating, grout at least 6 inches at each jamb anchor.
3. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground, unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
4. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

B. Bonding Compound: Apply on unit masonry and concrete substrates for direct application of plaster.

C. Walls; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork with 7/8-inch total thickness, as follows:
1. Portland cement mixes.

D. Ceilings; Base-Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three-coat plasterwork and having 7/8 3/4-inch (19-mm) total thickness., as follows:
1. Portland cement mixes.

E. Walls; Base-Coat Mix: For base (scratch) coat, for two-coat plasterwork and having 3/8-inch (10-mm) thickness on masonry, 1/4-inch (6-mm) thickness on concrete, as follows:
1. Portland cement mix.

C. Plaster Finish Coats: Finish plaster true and even within 1/8-inch tolerance in 5 feet, and leave the finished surfaces free tool marks and other blemishes.
1. Texture: Apply to provide custom Santa Barbara smooth finish, or finish indicated on Drawings to match Architect's sample,
2. Ready-Mixed Finish: Apply ready-mixed finish coats according to manufacturer's written instructions.

3.6 FOAM SHAPE APPLICATION

A. Adhere foam shapes to brown coat in accordance with manufacturer's written instructions.

B. Adhere and mechanically fasten larger shapes to plywood substrate in accordance with manufacturer's written instructions.

C. Cure at least 48 hours before applying finish coat.

3.6 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION 092400

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Interior gypsum board.
2. Exterior gypsum board for ceilings and soffits.
3. Tile backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Ceiling and wall materials shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. CertainTeed Corp.
2. Georgia-Pacific Gypsum LLC.
3. National Gypsum Company.
4. USG Corporation.

B. Gypsum Wallboard: ASTM C 1396/C 1396M.
1. Thickness: 1/2 inch, or as indicated on Drawings.
2. Long Edges: Tapered.

C. Gypsum Board, Type X: ASTM C 1396/C 1396M.
1. Thickness: 5/8 inch.
2. Long Edges: Tapered.

D. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
1. Thickness: 1/2 inch, or as indicated on Drawings.
2. Long Edges: Tapered.

E. Moisture and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
1. Core: 1/2 inch, regular type or 5/8 inch Type X as indicated.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 EXTERIOR GYPSUM BOARD FOR CEILINGS AND SOFFITS

A. Exterior Gypsum Soffit Board: ASTM C 1396/C 1396M, with manufacturer's standard edges.
1. Core: Core: 1/2 inch, regular type or 5/8 inch Type X as indicated.

B. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
1. Core: Core: 1/2 inch, regular type or 5/8 inch Type X as indicated.

2.5 TILE BACKING PANELS

A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
1. Core: 1/2 inch, regular type or 5/8 inch Type X as indicated.
2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

B. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
1. Thickness: Core: 1/2 inch, regular type or 5/8 inch Type X as indicated.
2. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.6 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.
1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:
    a. Cornerbead.
    b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    c. L-Bead: L-shaped; exposed long flange receives joint compound.
    d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    e. Expansion (control) joint.

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6/30/2025
RENEWAL DATE

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

SP.5

SHEET OF

B. Exterior Trim: ASTM C 1047.

1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.

2. Shapes:

a. Cornerbead.

b. LC-Bead: J-shaped; exposed long flange receives joint compound.

c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

2.7 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

2. Exterior Gypsum Soffit Board: Paper.

3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.

4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.

4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.

5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound, drying-type, all-purpose compound or high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

D. Joint Compound for Exterior Applications:

1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting-type, sandable topping compound.

2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

E. Joint Compound for Tile Backing Panels:

1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.

2. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.8 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

C. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

F. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C 840 and GA 216.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

E. Prefill open joints and damaged surface areas.

F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840 and GA 216:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Panels that are substrate for tile and where indicated on Drawings.

3. Level 3: Where indicated on Drawings.

4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

5. Level 5: Where indicated on Drawings.

H. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

I. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

J. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 093013 - CERAMIC TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Quarry tile.

2. Porcelain tile.

3. Glazed wall tile.

4. Tile backing panels.

5. Waterproof membrane.

6. Crack isolation membrane.

7. Metal edge strips.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Each type and composition of tile and for each color and finish required

2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required. Duplicate panels of 4 tiles each, showing range in shades of each color.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Installer is a five-star member of the National Tile Contractors Association or a Trowel of Excellence member of the Tile Contractors' Association of America.

2. Installer's supervisor for Project holds the International Masonry Institute's Foreman Certification.

3. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

B. Pre-construction Meeting

1. The Contractor shall schedule a pre-construction meeting for the week prior to the start of tile installation. Attendance at the meeting shall be mandatory for, the Architect, the Contractor, the tile subcontractor and owners representative (may or may not be in attendance) Not less than two weeks before the meeting, the Contractor shall notify all parties in writing of the meeting date and time.

2. The purpose of the pre-tile meeting is to review and discuss acceptable methods and workmanship for the installation of ceramic tile based on the CTI publication "Standards of the Tile Trade."

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. In advance of the pre-tile meeting, the tile subcontractor shall install a sample of the sales floor aisles, at 90 degree intersection of aisles, to illustrate the metal edge strip; border and field tile layout; grout joint sizes and grouting. Architect shall check trowels, adhesive thickness, materials, etc.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE MANUFACTURERS / PRODUCTS

A. Tile manufacturer's, colors and patterns shall be as indicated on Architectural drawings.

2.3 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C 1325, Type A.

1. Thickness: 1/2 inch (12.7 mm) unless indicated otherwise on Drawings.

2.5 WATERPROOF MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer, unless otherwise indicated on Drawings.

2.6 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

2.7 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

B. Acrylic Modified Dry-Set Mortar (Thinset): ANSI A118.4.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.

b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

2. Provide prepackaged, dry-mortar mix combined with acrylic resin liquid-latex additive at Project site.

3. For wall applications, provide nonsagging mortar.

C. Improved Acrylic Modified Dry-Set Mortar (Thinset): ANSI A118.15.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.

b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

2. Provide prepackaged, dry-mortar mix combined with acrylic resin liquid-latex additive at Project site.

3. For wall applications, provide nonsagging mortar.

2.8 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

B. Standard Cement Grout: ANSI A118.6.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.

b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

C. High-Performance Tile Grout: ANSI A118.7.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.

b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

2. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.

3. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.

D. Water-Cleanable Epoxy Grout: ANSI A118.3, with a VOC content of 65 g/L or less, or as required to comply with the requirements of the current edition of the California Green Building Standards Code – Nonresidential.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Custom Building Products.

b. LATICRETE SUPERCAP, LLC.

c. MAPEI Corporation.

2.9 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A 666, 300 Series, unless indicated otherwise..

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:

a. Custom Building Products., penetrating sealer as selected by Architect.

2.10 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with adhesives, bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 CERAMIC TILE INSTALLATION

A. Comply with current version of TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

a. Exterior tile floors.

b. Tile floors in wet areas.

c. Tile floors consisting of tiles 8 by 8 inches (200 by 200 mm) or larger.

d. Tile floors consisting of rib-backed tiles.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths unless indicated otherwise in Drawings.

1. Quarry Tile: 1/4 inch (6.4 mm)] [3/8 inch (9.5 mm).

2. Glazed Wall Tile: 1/16 inch (1.6 mm)] [1/8 inch (3.2 mm).

3. Porcelain Tile: 1/4 inch (6.4 mm)

H. Lay out tile wainscots to dimensions indicated or to next full tile beyond dimensions indicated.

I. Expansion Joints and Control Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

2. When it is not possible to lay out tile to produce full tiles at slab joints, the last tile shall be cut to end at the slab joint as long as the resulting piece is at least 6" in width at 12" tile and 8" in width at 16" tile. If a lesser dimension will result, the last full tile shall also be omitted and two rows of cut tile of equal width shall be installed to end at the joint. The tile layout on the other side of the joint shall begin again with full tiles.

J. Curing: Floors shall be covered with waterproofed paper, joints lapped at least 4 inches and tape sealed, or held down with planks or other weight. Floors shall be allowed to damp cure for a minimum of 72 hours before foot traffic is permitted on the tile.

K. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile or below top of tile and no threshold is indicated.

L. Floor Sealer: Apply floor sealer to grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

M. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated. Use modified dry-set mortar for bonding material unless otherwise directed in manufacturer's written instructions.]

N. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

O. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

3.4 CLEANING, SEALING AND PROTECTION

A. The contractor shall install tile, remove all excess grout and have the tile in "mop-clean" condition. No acid wash or sealing is required.

B. Tiled floor areas shall be covered with waterproofed building paper before foot traffic usage is permitted over the finished floors. Board walkways shall be laid on tiled floors to be continuously used as passage ways by workmen.

C. Damaged or defective tiles shall be replaced at no additional cost to the Owner.

3.5 EXTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Exterior Wall Installations, Wood or Metal Studs:

1. Ceramic Tile Installation: TCNA W244E; thinset mortar over waterproof membrane on cementitious backer units over weather resistive barrier.

a. Ceramic Tile Type: As indicated on Drawings.

b. Thinset Mortar: Modified dry-set or improved modified dry-set mortar.

c. Grout: As recommended by tile and grout manufacturers for installation conditions.

3.6 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:

1. Ceramic Tile Installation: TCNA F115; thinset mortar; epoxy grout.

a. Ceramic Tile Type: As indicated on Drawings.

b. Thinset Mortar: [Modified dry-set or Improved modified dry-set mortar.

c. Grout: Water-cleanable epoxy grout.

B. Interior Wall Installations, Wood or Metal Studs or Furring:

1. Ceramic Tile Installation: TCNA W243; thinset mortar on gypsum board.

a. Ceramic Tile Type: As indicated on Drawings.

b. Thinset Mortar: Modified dry-set or Improved modified dry-set mortar.

c. Grout: Water-cleanable epoxy grout.

2. Ceramic Tile Installation: TCNA W244C; thinset mortar on cementitious backer units or fiber-cement backer board.

a. Ceramic Tile Type: As indicated on Drawings.

b. Thinset Mortar: Modified dry-set or Improved modified dry-set mortar.

c. Grout: Water-cleanable epoxy grout.

3. Ceramic Tile Installation: TCNA W245; thinset mortar on glass-mat, water-resistant gypsum backer board.

a. Ceramic Tile Type: As indicated on Drawings.

b. Thinset Mortar: Modified dry-set or Improved modified dry-set mortar.

c. Grout: Water-cleanable epoxy grout.

END OF SECTION 093013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and CBC requirements.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E 1264.

2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL PANELS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Armstrong World Industries, Inc., or approved equal.

B. Acoustical Panel Standard: Manufacturer's standard panels according to ASTM E 1264.

C. Acoustical Panels: Acceptable Product: CLEAN ROOM VL, 870 as manufactured by Armstrong World Industries, or as indicated on Drawings.

1. Surface Texture: Smooth

2. Composition: Mineral Fiber

3. Color: White

4. Size: 24IN x 48IN

5. Edge Profile: Square Lay-In 15/16 or 1-1/2IN for interface with PRELUDE XL Fire Guard 15/16" Exposed Tee grid.

6. Noise Reduction Coefficient(NRC):

7. Ceiling Attenuation Class (CAC) : ASTM C 1414; Classified with UL label on product carton 40

8. Sabin:N/A

9. Articulation Class (AC):

10. Flame Spread: ASTM E 1264; Fire Resistive

11. Light Reflectance (LR) White Panel: ASTM E 1477; 0.80

12. Dimensional Stability: HumiGuard Plus

13. Recycle Content: Post-Consumer - 1% Pre-Consumer - 40%

D. Color: White, unless indicated otherwise on Drawings or selected by Architect.

2.3 METAL SUSPENSION SYSTEM

A. Metal Suspension System: Acceptable Product: with PRELUDE XL Fire Guard 15/16" Exposed Tee grid as manufactured by Armstrong World Industries

B. Metal Suspension-System Standard: Manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main beams and cross tees, base metal and end detail, fabricated from commercial quality hot dipped galvanized steel complying with ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping prefinished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching.

1. Structural Classification: Heavy-duty system.

2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.

3. Face Design: Flat, flush.

2.4 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements and local code requirements.

B. Compression Strut; Manufacturer's standard compression strut complying with seismic design requirements and local code requirements.

C. Hold-Down Clips: Manufacturer's standard hold-down.

D. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

E. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical panels in place during a seismic event.

2.5 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

2.6 PROTECTION KIT

A. One hour UL rated protection kit shall be USG Thermafiber installed over recessed light fixtures where indicated or required.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings in compliance with CBC 808.1.1.1d 1613, and according to ASTM C 636/C 636M, seismic design requirements, and manufacturer's written instructions and with the authorities having jurisdiction and CISCA's "Ceiling Systems Handbook."

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Install ceiling systems in a manner capable of supporting all superimposed loads, with maximum permissible deflection of 1/360 of span and maximum surface deviation of 1/8 inch in 10 ft. (1/960).

C. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work. Ensure the layout of hangers and carrying channels are located to accommodate fittings and units of equipment which are to be placed after the installation of ceiling grid systems.

D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest adjacent hangers and related carrying channels as required to span the required distance.

E. Supply hangers or inserts for installation to the respective section in ample time and with clear instructions for their correct placement. If steel deck is not supplied with hanger tabs, coordinate the installation of hanger clips during steel deck erection. Provide additional hangers and inserts as required.

F. Hang independently of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of the longitudinal axis or face plane of adjacent members.

G. Do not support fixtures from or on main runners or cross runners if weight of the fixture causes the total dead load to exceed the deflection capability. In such cases, support fixture loads by supplementary hangers located within 6 inches of each corner, or support the fixtures independently.

H. Do not install fixtures so that main runners and cross runners will be eccentrically loaded. Where fixture installation would produce rotation of runners, provide stabilizer bars.

I. Install edge moldings at intersection of ceiling and vertical surfaces, using maximum lengths, straight, true to line and level. Miter corners. Provide edge moldings at junctions with other ceiling finishes.

J. Fit acoustic lay-in panels in place, free from damaged edges or other defects detrimental to appearance and function. Fit border units neatly against abutting surfaces.

K. At fire rated ceiling locations, install hold-down clips on all lay-in-panels to hold such panels tight to grid system.

3.4 SEISMIC REQUIREMENTS

A. General: Comply with all requirements of the current edition of the CBC and local agencies and jurisdictions. If conflicts exist between the requirements below and code and local agency requirements, comply with the most stringent.

B. Vertical Hangers:

1. Suspension wires shall be of #12 gauge spaced at 4' o.c. along each main runner. Suspension wires spaces at greater than 4' o.c. shall be of #10 gauge.

2. Each vertical wire shall be attached to the ceiling suspension member with a minimum of three turns and to the structure above with a connection capable of carrying not less than a 100 pound allowable load.

3. Suspension wires shall not hang more than 1-in-6 out-of-plumb unless counter sloping wires are provided.

C. Perimeter Hangers: At all locations the terminal ends of each cross runner or main runner shall be supported independently a maximum of 6" from each wall with #12 gauge wire.

D. Lateral Force Bracing: Horizontal restraint shall be effected by four #12 gauge wires secured to the main runner within 2" of the cross runner intersection and splayed 90 degrees from each other at an angle not exceeding 45 degrees from the plane of the ceiling. These horizontal restrain points shall be placed 12' o.c. in both directions with the first point within 4' from each wall. Attachment of the restraint wires to the structure above shall be adequate for the load imposed.

E. Provide 1-1/2" metal studs at 12' o.c. each way for vertical bracing to structure above. 8' x 16' spacing module for vertical bracing (occurring directly under purlins) is acceptable if verified as acceptable with Local Building Authority.

F. Attachment of Members to the Perimeter: To facilitate installation, main runners and cross runners should be attached to the perimeter member at two adjacent walls with clearance between the wall and the runners maintained at the other two walls.

G. Lighting Fixtures:

1. Recessed:

a. All recessed lighting fixtures shall be firmly affixed to the suspended ceiling system. The attachment device shall have a capacity of 100% of the lighting fixture weight acting in any direction.

b. Where "INTERMEDIATE" systems are used, #12 gauge hangers shall be provided to the grid members within 3" of each corner of each fixture.

c. When cross runners are used without supplemental hangers to support lighting fixtures, these cross runners must provide the same carrying capacity as the main runner.

d. Lighting fixtures weighing less than 20# shall be positively attached to the ceiling system main runners or to cross runners with the same carrying capacity as the main runners.

e. Lighting fixtures weighing more than 20# but less than 56#, shall have, in addition to the requirements outlined in 1, 2, and 3 above, two #10 gauge hangers connected from the fixture housing to the structure above.

f. Lighting fixtures weighing more than 56# shall be supported directly from the structure above by approved hangers.

2. Surface Mounted: Surface mounted lighting fixtures shall be attached to the ceiling systems with positive clamping devices which completely surround the supporting members. Safety wires shall be attached between the clamping device and the adjacent ceiling hanger or to the structure above. In no case shall the applied fixture load exceed the design carrying capacity of the supporting members.

3. Pendant Hung: Pendant hung lighting fixtures shall be supported directly from the structure above using #9 gauge wire without using the ceiling suspension system for direct support.

H. Mechanical Services

1. Under no circumstances shall the suspended ceiling system be used to support ductwork, plumbing services, etc.

3.5 ADJUSTMENTS

A. Adjust any sags or twists which develop in the ceiling systems and replace any part which is damaged or faulty.

3.6 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform inspections as required my local codes and jurisdictions and/or manufacturer.

1. Periodic inspection during the installation of suspended ceiling grids according to ASCE/SEI 7, or as required by local codes and jurisdictions.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rubber base.

2. Rubber stair accessories.

3. Rubber molding accessories.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE <Insert drawing designation>

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Burke Mercer Flooring Products; a division of Burke Industries Inc.

2. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).

1. Style and Location:

a. Style B, Cove: Provide in areas indicated.

C. Thickness: 0.125 inch.

D. Height: 6 inches unless indicated otherwise on Drawings.

E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

F. Outside Corners: Job formed or preformed.

G. Inside Corners: Job formed or preformed.

H. Colors: As indicated on Drawings or selected by Architect.

2.2 THERMOPLASTIC-RUBBER BASE

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Burke Mercer Flooring Products; a division of Burke Industries Inc.

2. Roppe Corporation, USA.

B. Product Standard: ASTM F 1861, Type TP (rubber, thermoplastic).

1. Group: I (solid, homogeneous).

2. Style and Location:

a. Style B, Cove: Provide in areas indicated

C. Thickness: 0.125 inch.

D. Height: 6 inches unless indicated otherwise on Drawings.

E. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.

F. Outside Corners: Job formed or preformed.

G. Inside Corners: Job formed or preformed.

H. Colors: As indicated on Drawings or selected by Architect.

2.3 RUBBER STAIR ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Burke Mercer Flooring Products; a division of Burke Industries Inc.

2. Roppe Corporation, USA.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

C. Stair Treads: ASTM F 2169.

1. Type: TS (rubber, vulcanized thermoset).

2. Class: 1, (smooth – flat) or 2 (pattern; embossed, grooved, or ribbed), as selected by Architect and required to meet slip resistance requirements.

3. Group: Group 1, (with embedded abrasive strips in contrasting color for the visually impaired) or 2 (with contrasting color for the visually impaired).

4. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees

5. Nosing Height: 1-1/2 inches (38 mm), or manufacturerer's standard

6. Thickness: 1/4 inch (6 mm) and tapered to back edge.

7. Size: Lengths and depths to fit each stair tread in one piece.

8. Integral Risers: Smooth, flat; in height that fully covers substrate.

9. Stair treads to comply with ADA, Visually-Impaired and California Title 24 requirements.

D. Separate Risers (if required): Smooth, flat; in height that fully covers substrate; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

1. Style: Coved toe, 7 inches (or as required to match stair riser height) by length matching treads, or Toeless, by length matching treads.

2. Thickness: Manufacturer's standard.

E. Locations: Provide rubber stair accessories in stair areas indicated.

F. Colors and Patterns: As selected by Owner or Architect.

2.4 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated. Comply with the VOC requirements of the current edition of the California Green Building Standards Code – Nonresidential.

C. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

D. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient stair-tread manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.

b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient products until materials are the same temperature as space where they are to be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.2 RESILIENT BASE INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient base.

B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

E. Do not stretch resilient base during installation.

F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

G. Preformed Corners: Install preformed corners before installing straight pieces.

H. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length, or more if possible.

a. Form without producing discoloration (whitening) at bends.

2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 6 inches in length, or more if possible.

a. Miter or cope corners to minimize open joints.

3.3 RESILIENT ACCESSORY INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient accessories.

B. Resilient Stair Accessories:

1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.

2. Tightly adhere to substrates throughout length of each piece.

3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.

B. Floor Polish: Remove soil, adhesive, and blemishes from resilient stair treads before applying liquid floor polish.

1. Apply [one] [two] [three] <Insert requirement> coat(s).

C. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 096513

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resilient, linoleum sheet flooring, adhesive and heat welded seams installation.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color, texture, and pattern specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 RESILIENT LINOLEUM SHEET FLOORING.

A. Products: Subject to compliance with requirements, provide the following or approved equal:

1. Armstrong World Industries, Inc.;

a. "Marmorette", linoleum sheet flooring

B. Product Standard: ASTM F 2034, Type 1.

C. Thickness: 0.100 inch.

D. Sheet Width: As standard with manufacturer.

E. Finish: "NATURCote II", UV Cured Polyurethane

F. Seamless-Installation Method: Heat welded.

G. Colors and Patterns: As indicated by on Drawings

2.3 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated. Comply with the VOC requirements of the current edition of the California Green Building Standards Code – Nonresidential.

C. Seamless-Installation Accessories:

1. Heat-Welding Bead: Manufacturer's solid-strand product for heat welding seams.

a. Colors: Match flooring.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.

4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)] in 24 hours.

b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install resilient sheet flooring until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.2 RESILIENT LINOLEUM SHEET FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient linoleum sheet flooring.

B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.

C. Lay out resilient sheet flooring as follows:

1. Maintain uniformity of flooring direction.

2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.

3. Match edges of flooring for color shading at seams.

4. Avoid cross seams.

D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.

G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.

H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

I. Seamless Installation:

1. Heat-Welded Seams: Comply with ASTM F 1516. Rout joints and heat weld with welding bead to fuse sections permanently into a seamless flooring installation. Prepare, weld, and finish seams to produce surfaces flush with adjoining flooring surfaces.

J. Do not allow traffic on the flooring for 24 hours after installation.

K. Newly installed flooring should not be exposed to rolling load traffic for at least 72 hours after installation to allow setting and drying of the adhesive.

3.3 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing tile installation:

1. Remove visible adhesive and other surface blemishes using cleaner recommended by tile manufacturers.

2. Sweep or vacuum floor thoroughly.

3. Do not wash floor until after time period recommended by resilient floor tile manufacturer.

4. Damp-mop tile to remove black marks and soil.

B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by tile manufacturer. Remove and legally dispose of protective covering at time of substantial completion.

END OF SECTION 096516

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on exterior substrates. Including but not limited to the following:

1. Concrete.

2. Fiber-cement board.

3. Concrete masonry units (CMUs).

4. Steel and iron.

5. Galvanized metal.

6. Aluminum (not anodized or otherwise coated).

7. Wood.

8. Plastic.

9. Portland cement plaster (stucco).

10. Gypsum board.

B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Sustainable Design Submittals:

1. Product Data: For paints and coatings, indicating VOC content.

2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.

C. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Architect will select one surface to represent surfaces and conditions for application of each paint system.

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).

b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.

a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The paint systems described in these specifications are based upon products manufactured by PPG Paints (Basis of Design).

1. All listed colors as indicated on drawings may be selected from various manufacturer's but shall be provided and installed in exact color and finish to match from a single source manufacturer.

B. Products of the other manufacturers listed below will be accepted when it is demonstrated to the Architect that they are equal in composition, durability, usefulness, and convenience for the purpose intended, provided the following minimum conditions are met.

1. The proposed paint system shall use an equal or greater number of separate costs to achieve the required dry film thickness.

2. The proposed paint system shall use paints of the same generic type as that specified.

3. Requests for substitution shall have directions for application and descriptive literature which includes generic type, percent solids by volume, volatile organic content (grams per liter) and information confirming that the substitution is equal to the specified paint system.

C. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. PPG Paints (Basis of Design).

2. Benjamin Moore and Co.

D. Products: Subject to compliance with requirements, provide the products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. VOC Content: For field applications, paints and coatings shall comply with VOC content limits of authorities having jurisdiction. Comply with the requirements of the current edition of the California Green Building Standards Code – Nonresidential.

C. Colors and gloss: As indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.

2. Fiber-Cement Board: 12 percent.

3. Masonry (Clay and CMUs): 12 percent.

4. Wood: 15 percent.

5. Portland Cement Plaster: 12 percent.

6. Gypsum Board: 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 CLEANING AND PROTECTION

A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System

a. Prime Coat: Primer, alkali resistant, water based

1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603

b. Prime Coat: Latex, exterior, matching topcoat.

c. Intermediate Coat: Latex, exterior, matching topcoat.

d. Topcoat: Latex, exterior, flat (MPI Gloss Level 1

1) PPG Paints; Fortis 350 Exterior 100% acrylic Flat 2200G

e. Topcoat: Latex, exterior, low sheen

1) PPG Paints; Fortis 350 Exterior 100% Acrylic Satin 2402G

f. Topcoat: Latex, exterior, semi-gloss

1) PPG Paints; Fortis 350 Exterior 100% Acrylic Semi-gloss 2406G

2. Latex over Latex Aggregate System

a. Prime Coat: Textured coating, latex, flat.

1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, flat (MPI Gloss Level 1).

1) PPG Paints; Fortis 350 100% Acrylic Flat 2200G

d. Topcoat: Latex, exterior, low sheen

1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G

e. Topcoat: Latex, exterior, semi-gloss

1) PPG Paints; Fortis 350 100% Acrylic Semi Gloss 2406G

3. Latex Aggregate System

a. Prime Coat: As recommended in writing by topcoat manufacturer.

1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603

b. Intermediate Coat: As recommended in writing by topcoat manufacturer.

1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60

c. Topcoat: Textured coating, latex, nonflat,

1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60

d. Topcoat: Textured coating, latex, fla].

1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60

4. High-Build Latex System Dry film thickness of not less than 10 mils (0.25 mm).

a. Prime Coat: As recommended in writing by topcoat manufacturer.

1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603

b. Intermediate Coat: As recommended in writing by topcoat manufacturer.

1) Perma-Crete High Build 100% Acrylic Topcoat 4-22

c. Topcoat: Latex, exterior, high build

1) Perma-Crete High Build 100% Acrylic Topcoat 4-22

B. Concrete Substrates, Traffic Surfaces: Drive slab (clear) or entry walkways(pigment)

1. Latex Floor Paint System

a. Prime Coat: Floor paint, latex, matching topcoat.

b. Intermediate Coat: Floor paint, latex, matching topcoat.

c. Topcoat: Floor paint, latex, low gloss

1) Perm-Crete Acrylic Topcoat 4-22

2. Clear Water-Based Sealer System

a. Prime Coat: Sealer, water based, matching topcoat.

b. Intermediate Coat: Sealer, water based, matching topcoat.

c. Topcoat: Sealer, water based, for concrete floors

1) PPG Paints; Perma-Crete Plex Seal WB Int/Ext. Clear Sealer 4-6200

C. CMU Substrates:

1. Latex System

a. Prime Coat: Block filler, latex, interior/exterior

1) PPG Paints; Concrete Coatings Block Filler Int/Ext Primer 3010

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior, flat

1) PPG Paints; Fortis 350 100% Acrylic flat 2200G

d. Topcoat: Latex, exterior, low sheen

1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G

e. Topcoat: Latex, exterior, semi-gloss].

1) PPG Paints; Fortis 350 100%Acrylic Semi-gloss 2406G

2. Latex over Alkali-Resistant Primer System

a. Prime Coat: Primer, alkali resistant, water based

1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603

b. Intermediate Coat: Latex, exterior, matching topcoat.

c. Topcoat: Latex, exterior,

1) PPG Paints; Fortis 350 100%Acrylic Flat 2200G

d. Topcoat: Latex, exterior, low sheen

1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G

e. Topcoat: Latex, exterior, semi-gloss

1) PPG Paints; Fortis 350 100% Acrylic Semi-gloss 2406G

3. High-Build Latex System: Dry film thickness of not less than 10 mils (0.25 mm).

a. Prime Coat: As recommended in writing by topcoat manufacturer.

1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603

b. Intermediate Coat: As recommended in writing by topcoat manufacturer.

c. Topcoat: Latex, exterior, high build

1) Perma-Crete High Build 100% Acrylic Topcoat 4-22

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MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
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TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

SP.6

SHEET OF

D. Steel and Iron Substrates: (Exposed beam)
1. Water-Based Light Industrial Coating System]:
a. Prime Coat: Primer,
1) PPG Paints; Pitt Tech Plus DTM Primer 90-912
b. Prime Coat: Primer, rust inhibitive, water based.
1) PPG Paints; Pitt Tech Plus DTM Primer 90-912
c. Prime Coat: Primer, epoxy, anti-corrosive
1) PPG Paints; Amerlock 400
d. Prime Coat: Shop primer specified in Section where substrate is specified.
e. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
f. Topcoat: Light industrial coating, exterior, water based
1) PPG Paints; Pitt-Tech Plus DTM Satin 90-1110
g. Topcoat: Light industrial coating, exterior, water based, semi-gloss
1) PPG Paints; Pitt-Tech Plus DTM Semi-Gloss 90-1210
h. Topcoat: Light industrial coating, exterior, water based, gloss
1) PPG Paints; Pitt-Tech Plus DTM Gloss 90-1310

E. Galvanized-Metal Substrates:
1. Latex System:
a. Prime Coat: Primer, galvanized, water based
1) PPG Paints; Pitt Tech Plus DTM Primer 90-912
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, flat
1) PPG Paints; Fortis 350 100% Acrylic flat 2200G
d. Topcoat: Latex, exterior, low
1) PPG Paints; Fortis 350 100% Acrylic satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic semi-gloss 2406G
2. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, galvanized, water based
1) PPG Paints; Pitt Tech Plus DTM Primer 90-912
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
c. Topcoat: Light industrial coating, exterior, water based
1) PPG Paints; Pitt-Tech Plus DTM Satin 90-1110
d. Topcoat: Light industrial coating, exterior, water based, semi-gloss
1) PPG Paints; Pitt-Tech Plus DTM Semi-Gloss 90-1210
e. Topcoat: Light industrial coating, exterior, water based, gloss
1) PPG Paints; Pitt-Tech Plus DTM Gloss 90-1310

F. Aluminum Substrates:
1. Latex System[
a. Prime Coat: Primer, quick dry, for aluminum
1) PPG Paints Pitt Tech Plus 90-912
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, flat
1) PPG PaintsFortis 350 100% Acrylic Flat 2200G
d. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100$ Acrylic Satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic Semi-gloss 2406G
2. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, quick dry, for aluminum
1) PPG Paints Pitt-Tech Plus primer 90-912.
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
c. Topcoat: Light industrial coating, exterior, water based
1) PPG Paints; Pitt-Tech Plus DTM Satin 90-1110
d. Topcoat: Light industrial coating, exterior, water based, semi-gloss
1) PPG Paints; Pitt-Tech Plus DTM Semi-Gloss 90-1210
e. Topcoat: Light industrial coating, exterior, water based, gloss
1) PPG Paints; Pitt-Tech Plus DTM Gloss 90-1310

G. Copper Substrates:
1. Latex System:
a. Prime Coat: Primer, quick dry, for aluminum
1) PPG Paints Pitt Tech Plus Primer 90-912
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior,
1) PPG Paints; Fortis 350 100% Acrylic flat 2200G
d. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic Semi-Gloss 2406G
2. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, quick dry, for aluminum
1) PPG Paints; Pitt-Tech Plus DTM Primer 90-912
b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
1) PPG Paints; Pitt-Tech Plus DTM Satin 90-1110
c. Topcoat: Light industrial coating, exterior, water based, semi-gloss
1) PPG Paints; Pitt-Tech Plus DTM Semi-Gloss 90-1210
d. Topcoat: Light industrial coating, exterior, water based, gloss
1) PPG Paints; Pitt-Tech Plus DTM Gloss 90-1310

H. Wood Substrates: Glued-laminated construction.
1. Latex over Latex Primer System
a. Prime Coat: Primer, latex for exterior wood
1) PPG Paints; Gripper Int/Ext Primer Sealer 3210
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, flat
1) PPG Paints; Fortis 350 100% Acrylic Flat 2200G
d. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic Semi-gloss 2406G

I. Wood Substrates: Exposed framing.
1. Latex over Latex Primer System
a. Prime Coat: Primer, latex for exterior wood (Not redwood)
1) PPG Paints; Gripper Int/Ext Primer Sealer 3210
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, flat
1) PPG Paints; Fortis 350 100% Acrylic flat 2200G
d. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic Semi-gloss 2406G

J. Wood Substrates: Wood trim, Architectural woodwork, Doors, Wood board siding and wood fences.
1. Latex over Latex Primer System
a. Prime Coat: Primer, latex for exterior wood
1) PPG Paints; Gripper Int/Ext Primer Sealer 3210
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior, flat (
1) PPG Paints; Fortis 350 100% Acrylic Flat 2200G
d. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100% Acrylic Satin 2402G
e. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic Semi-gloss 2406G

K. Wood Substrates: Wood-based panel products. (cedar, IPE, etc siding.)
1. Latex over Latex Primer System
a. Prime Coat: Primer, latex for exterior wood
1) PPG Flood UV (Clear Wood Finish) 565 Semi-transparent, Acrylic Stain
b. Intermediate Coat: Latex, exterior, matching topcoat.
c. Topcoat: Latex, exterior,
1) PPG Flood UV (Clear Wood Finish) 565 Semi-transparent Acrylic Stain.
d. Topcoat: Latex, exterior, low sheen
1) PPG Flood UV (Clear Wood Finish) 565 Semi-transparent Acrylic Stain

L. Portland Cement Plaster Substrates:
1. Latex System
a. Prime Coat: Latex, exterior, matching topcoat.
b. Prime Coat: Primer, alkali resistant, water based.
1) PPG Paints; Perma-Crete Alkali Resistant Primer 4-603
c. Intermediate Coat: Latex, exterior, matching topcoat.
d. Topcoat: Latex, exterior, flat
1) PPG Paints; Fortis 350 100% Acrylic flat 2200G
e. Topcoat: Latex, exterior, low sheen
1) PPG Paints; Fortis 350 100% Acrylic satin 2402G
f. Topcoat: Latex, exterior, semi-gloss
1) PPG Paints; Fortis 350 100% Acrylic semi-gloss 2406G
2. High-Build Latex System: Dry film thickness of not less than 10 mils (0.25 mm).
a. Prime Coat: As recommended in writing by topcoat manufacturer.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: Latex, exterior, high build[,
1) Perma-Crete High Build 100% Acrylic Topcoat 4-22
3. Latex Aggregate System:
a. Prime Coat: As recommended in writing by topcoat manufacturer.
b. Intermediate Coat: As recommended in writing by topcoat manufacturer.
c. Topcoat: Textured coating, latex,
1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60
d. Topcoat: Textured coating, latex, flat[
1) PPG Paints; Perma-Crete Texture Coating 4-50/4-60

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes surface preparation and the application of paint systems on interior substrates:
1. Concrete.
2. Concrete masonry units (CMUs).
3. Steel and iron.
4. Galvanized metal.
5. Aluminum (not anodized or otherwise coated).
6. Wood.
7. Plastic.
8. Gypsum board.
9. Plaster.
10. Cotton or canvas insulation covering.
11. ASJ insulation covering.

B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1.2 DEFINITIONS
A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product. Include preparation requirements and application instructions.
1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
B. Sustainable Design Submittals:
1. Product Data: For paints and coatings, indicating VOC content.
2. Laboratory Test Reports: For paints and coatings, indicating compliance with requirements for low-emitting materials.
C. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE
A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.
2. Final approval of color selections will be based on mockups.
a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. The paint systems described in these specifications are based upon products manufactured by PPG Paints (Basis of Design).
1. All listed colors as indicated on drawings may be selected from various manufacturer's but shall be provided and installed in exact color and finish to match from a single source manufacturer.
B. Products of the other manufacturers listed below will be accepted when it is demonstrated to the Architect that they are equal in composition, durability, usefulness, and convenience for the purpose intended, provided the following minimum conditions are met.
1. The proposed paint system shall use an equal or greater number of separate costs to achieve the required dry film thickness.
2. The proposed paint system shall use paints of the same generic type as that specified.
3. Requests for substitution shall have directions for application and descriptive literature which includes generic type, percent solids by volume, volatile organic content (grams per liter) and information confirming that the substitution is equal to the specified paint system.
C. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
1. PPG Paints (Basis of Design).
2. Benjamin Moore and Co.
D. Products: Subject to compliance with requirements, provide the products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL
A. Material Compatibility:
1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
B. VOC Content: For field applications that are inside the weatherproofing system, paints and coatings shall comply with VOC content limits of authorities having jurisdiction. Comply with the requirements of the current edition of the California Green Building Standards Code – Nonresidential.
C. Low-Emitting Materials: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
D. Colors and gloss: As indicated on Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.
3. Masonry (Clay and CMUs): 12 percent.
4. Wood: 15 percent.
5. Gypsum Board: 12 percent.
6. Plaster: 12 percent.
C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION
A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION
A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 INTERIOR PAINTING SCHEDULE
A. Concrete Substrates, Nontraffic Surfaces: (Walls)
1. Latex System
a. Prime Coat: Primer, alkali resistant, water based.
1) PPG Paints Perma-Crete Alkaline Resistant Primer 4-603
b. Prime Coat: Latex, interior, matching topcoat.
c. Intermediate Coat: Latex, interior, matching topcoat.
d. Topcoat: Latex, interior, flat (MPI Gloss Level 1)
1) PPG Paints Pure Performance Latex Flat 9-100 series
e. Topcoat: Latex, interior (MPI Gloss Level 3)
1) PPG Paints Pure Performance Latex Eggshell 9-300 XI
f. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5)
1) PPG Paints Pure Performance Latex Semi-Gloss 9-500 Series
2) PPG Paints Ultra-Hide 150 3038 G
2. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, alkali resistant, water based
1) PPG Paints Perma-Crete Alkali Resistant Primer 4-603.
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3
1) PPG Paints Pitt-Tech Plus Satin DTM 90-1110.
d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1210
e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1310
B. Concrete Substrates, Traffic Surfaces: (Car wash tunnels)
1. Latex Floor Enamel System
a. Prime Coat: Floor paint, latex, matching topcoat.
b. Intermediate Coat: Floor paint, latex, matching topcoat.
c. Topcoat: Floor paint, latex, low gloss (maximum MPI Gloss Level 5 Semi-Gloss)
1) PPG Paints Amerlock 2 series
2. Alkyd Floor Enamel System (Sales area floors for abrasion resistance, walk-in cooler)
a. Prime Coat: Floor enamel, alkyd, matching topcoat.
b. Intermediate Coat: Floor enamel, alkyd, matching topcoat.
c. Topcoat: Floor enamel, alkyd, gloss (MPI Gloss Level 6
1) PPG Paints Amerlock 2 series
C. CMU Substrates: (Car wash walls etc.)
1. Epoxy System
a. Block Filler: Block filler,
1) PPG Paints, Amerlock 2-400 Block Filler (BF)
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Epoxy Top Coat semi-gloss
1) PPG Paints Amerlock 2-400 series
2. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, rust-inhibitive, water based
1) PPG Paints Pitt-Tech Plus DTM Primer 90-912
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3)[, MPI #151].
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1110
d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5)[, MPI #153].
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1210
e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[, MPI #154].
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1310
D. Galvanized-Metal Substrates: (Entry)
1. Water-Based Light Industrial Coating System MPI INT 5.3B:
a. Prime Coat: Primer, galvanized, water based
1) PPG Paints Pitt-Tech Plus DTM Industrial Primer 90-912
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based
1) PPG Paints Pitt-Tech Plus DTM Satin 90-1110
d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5
1) PPG Paints Pitt-Tech Plus DTM Semi-gloss 90-1210.
e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)
1) PPG Paints Pitt-Tech Plus DTM Enamel 90-1310
E. Aluminum Substrates
1. Water-Based Light Industrial Coating System
a. Prime Coat: Primer, quick dry, for aluminum
1) PPG Paints Pitt-Tech Plus DTM Primer 90-912
b. Intermediate Coat: Light industrial coating, interior, water based, matching topcoat.
c. Topcoat: Light industrial coating, interior, water based (MPI Gloss Level 3
1) PPG Paints Pitt-Tech Plus DTM Satin 90-1110
d. Topcoat: Light industrial coating, interior, water based, semi-gloss (MPI Gloss Level 5
1) PPG Paints Pitt-Tech Plus DTM Semi- Gloss 90-1210
e. Topcoat: Light industrial coating, interior, water based, gloss (MPI Gloss Level 6)[,
1) PPG Paints Pitt-Tech Plus DTM Gloss Enamel 90-1310
F. Wood Substrates: Glued-laminated construction.
1. Latex over Latex Primer System
a. Prime Coat: Primer, latex, for interior wood
1) PPG Paints Seal Grip Primer 17-921
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat (MPI Gloss Level 1
1) PPG Paints Pure Performance Interior Flat 9-100
d. Topcoat: Latex, interior
1) PPG Paints Pure Performance Interior Eggshell 9-300 XI
e. Topcoat: Latex, interior
1) PPG Paints Pure Performance Interior Semi-Gloss 9-500
G. Wood Substrates: Exposed framing.
1. Latex over Latex Primer System Zero VOC
a. Prime Coat: Primer, latex, for interior wood
1) PPG Paints Seal Grip Primer 17-921
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat (MPI Gloss Level 1)
1) PPG Paints Pure Performance Interior Flat 9-100
d. Topcoat: Latex, interior
1) PPG Paints Pure Performance Interior Satin 9-300 XI
e. Topcoat: Latex, interior (MPI Gloss Level 6
1) PPG Paints Pure Performance Interior Semi-Gloss 9-500
f. Dry Fall System
1) PPG Paints Speedhide Super Tech WB Dry-Fog Flat Latex 6-723 XI series
g. Topcoat: Latex, interior, semi-gloss
1) PPG Paints Speedhide Super Tech Int. Dry-fog Semi-gloss Latex 6-724 XI
2. Institutional Low-Odor/VOC Latex System
a. Prime Coat: Primer, latex, for interior wood].
1) PPG Paints Seal Grip Primer 17-921
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1)
1) PPG Paints Pure Performance Latex 9-100
d. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 2)
1) PPG Paints Pure Performance Latex 9-300XI
e. Topcoat: Latex, interior, institutional low odor/VOC, semi-gloss (MPI Gloss Level 5)
1) PPG Paints Pure Performance Latex 9-500
H. Wood Substrates: Wood trim, Architectural woodwork, Doors and Windows,.
1. Latex For a Premium Grade system,
a. Prime and Intermediate Coat: Latex, interior, matching topcoat.
b. Topcoat: Latex, interior,
1) PPG Paints Break-Through Satin 50/250 WB Acrylic
c. Topcoat: Latex, interior
1) PPG Paints Break-Through Gloss 50/250 WB Acrylic
d. Topcoat: Latex, interior, gloss (MPI Gloss Level 6, except minimum gloss of 65 units at 60 degrees
1) PPG Paints Ultra-hide 150 or 250
2. Institutional Low-Odor/VOC Latex System
a. Prime Coat: Primer, latex, for interior wood
1) PPG Paints Seal Grip Primer 17-921
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1
1) PPG Paints Pure Performance Latex 9-100
d. Topcoat: Latex, interior, institutional low odor/VOC
1) PPG Paints Pure Performance Latex 9-300XI
e. Topcoat: Latex, interior, institutional low odor/VOC
1) PPG Paints Pure Performance Latex 9-500
I. Wood Substrates: Wood paneling and casework.
1. Latex
a. Prime Coat: Primer, latex, for interior wood
1) PPG Paints Seal Grip Primer 17-921
b. Intermediate Coat: Latex, interior, matching topcoat.
c. Topcoat: Latex, interior, flat (MPI Gloss Level 1
1) PPG Paints Break-Through 50/250 Satin or Gloss
J. Wood Substrates: Foot -Traffic surfaces, including [floors] [and] [stairs].
1. Latex Porch & Floor Enamel System
a. Prime Coat: Primer sealer, alkyd, interior
1) PPG Paints Seal Grip Primer 17-941 NF
b. Intermediate Coat: Floor paint, latex, matching topcoat.
c. Topcoat: Floor paint, latex, low gloss (maximum MPI Gloss Level 3)
1) PPG Paints Anti-Slip Single Component, WB Pedestrian Grade SFT 600
K. Gypsum Board and Plaster Substrates: (Back offices)
1. Latex over Latex Sealer System
a. Prime Coat: Primer sealer, latex, interior
1) PPG Paints Speedhide Zero VOC Latex Sealer 6-4900 XI
b. Prime Coat: Latex, interior, matching topcoat.
c. Intermediate Coat: Latex, interior, matching topcoat.
d. Topcoat: Latex, interior
1) PPG Paints Pure Performance Latex Eggshell 9-300 XI
e. Topcoat: Latex, interior
1) PPG Paints Pure Performance Latex Semi-gloss 9-500
2. Institutional Low-Odor/VOC Latex System
a. Prime Coat: Primer sealer, interior, institutional low odor/VOC
1) PPG Paints Speedhide Sealer 6-4900 XI
b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
c. Topcoat: Latex, interior, institutional low odor/VOC, flat (MPI Gloss Level 1
1) PPG Paints Pure Performance Latex Flat 9-100
d. Topcoat: Latex, interior, institutional low odor/VOC
1) PPG Paints Pure Performance Latex Eggshell 9-300 XI
e. Topcoat: Latex, interior, institutional low odor/VOC
1) PPG Paints Pure Performance Latex Semi-Gloss 9-500

END OF SECTION 099123

SECTION 099860 - SANITARY WALL PANELS

PART 1 - GENERAL

1.11 SUMMARY
This Section includes the following:
1. Fiberglass reinforced plastic panels (FRP)

1.2 SUBMITTALS
A. Product data for sanitary wall panel specified.
B. Samples in 12-inch square units of sanitary wall panel required and in each color, texture, and pattern indicated or selected for facing materials. Include representative samples of installation devices and accessories.

1.3 QUALITY ASSURANCE
A. Single Source Responsibility for Sanitary Wall Panels: Obtain sanitary wall panels from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying the progress of the work.

1.4 DELIVERY, STORAGE, AND HANDLING
A. Deliver materials to the Project site in original factory wrappings and containers, clearly labeled with identification of manufacturer, brand name, quality or grade, and fire hazard classification.

1.5 JOB CONDITIONS
A. Do not begin installation until spaces to receive sanitary wall panels have been enclosed and maintained at approximately the same humidity and temperature conditions as planned for occupancy. Maintain temperature and humidity as recommended by panel manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide the following product or equal:
1. Marlite, Inc., "Standard FRP"

2.2 MATERIALS
A. Fiberglass Reinforced Plastic Panels: Textured (pebbled): stain-and abrasion-resistant, moisture-resistant, fiberglass reinforced thermosetting polyester panels complying with ASTM D 5319 and the following requirements.
1. Nominal thickness: 0.09"
2. Flame spread and smoke developed, Class C (per ASTM E-84).
B. Accessories: Manufacturers standard non-staining nylon drive rivets and extruded PVC moldings to match panel color.
C. Adhesive and Sealant; Per manufacturer's recommendations.
D. Colors, Textures, and Patterns: Where manufacturer's standard material is indicated, provide sanitary wall panels complying with the following requirements;
1. Texture: "Smooth" or "Pebbled" as selected by Architect.
2. Color: As selected by Architect from manufacturer's full range of color options.
3. Panel Size: 4' x length indicated on Drawings (8'-0" or 10'-0").

PART 3 - EXECUTION

3.1 INSTALLATION
A. Install sanitary wall panels in locations indicated with vertical surfaces and edges plumb, top edges level, and in alignment with other panels, scribed to fit adjoining work accurately at borders and at penetrations. Company with panel manufacturer's printed instructions for installation of panels and trim moldings using type of mounting accessories as recommended by manufacturer.
1. Cut units to be at least 50 percent of unit width.
B. Remove and replace panels which are damaged and are unacceptable to Architect.
C. Installation shall provide neat and tight joints and shall comply with Health Department requirements per a sanitary installation.

3.2 CLEANING
A. Clean sanitary wall panels upon completion of installation, to remove dust and other foreign materials from the surface, using warm water and a clean sponge, wipe dry.
B. Remove surplus materials, rubbish and debris resulting from sanitary wall panel installation upon completion of work, and leave areas of installation in neat, clean condition.

END OF SECTION 099860

SECTION 102113 - METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes painted steel toilet compartments configured as toilet enclosures and urinal screens.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, and attachment details.
C. Samples for each type of toilet compartment material indicated.

1.3 INFORMATIONAL SUBMITTALS
A. Product certificates.

1.4 CLOSEOUT SUBMITTALS
A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities, local code accessibility requirements and ICC A117.1 for toilet compartments designated as accessible.

2.2 PAINTED STEEL TOILET COMPARTMENTS
A. Manufacturers: Subject to compliance with requirements, provide products by the following or approved equal:
1. Metpar Corp.
B. Toilet-Enclosure Style: Overhead braced or Floor anchored as indicated on Drawings.
C. Urinal-Screen Style: Wall hung with integral, internal mounting 'T' bracket.
D. Door, Panel, and Pilaster Construction: Seamless, metal facing sheets pressure laminated to core material; with continuous, interlocking molding strip or lapped-and-formed edge closures; corners secured by welding or clips and exposed welds ground smooth. Exposed surfaces shall be free of pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections.
1. Core Material: Manufacturer's standard sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) for doors and panels and 1-1/4 inches (32 mm) for pilasters.
2. Grab-Bar Reinforcement: Provide concealed internal reinforcement for grab bars mounted on units of size and material adequate for panel to withstand applied downward load on grab bar of at least 250 lbf (1112 N), when tested according to ASTM F 446, without deformation of panel.
3. Tapping Reinforcement: Provide concealed reinforcement for tapping (threading) at locations where machine screws are used for attaching items to units.
E. Urinal-Screen Construction:
1. Integral, internal mounting 'T' bracketl, Wall-Hung Urinal Screen: Similar to panel construction, with integral full-height 'T' flanges for wall attachment, and maximum 1-1/4 inches (32 mm) thick.
F. Facing Sheets and Closures: Electrolytically coated steel or hot-dip galvanized-steel sheet with nominal base-metal (uncoated) thicknesses as follows:
1. Pilasters, Braced at Both Ends: Manufacturer's standard thickness, but not less than 0.036 inch (0.91 mm).
2. Pilasters, Unbraced at One End: Manufacturer's standard thickness, but not less than 0.048 inch (1.21 mm).
3. Panels: Manufacturer's standard thickness, but not less than 0.036 inch (0.91 mm)].
4. Doors: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
5. Flat-Panel Urinal Screens: Thickness matching the panels.
6. Integral-Flange, Wall-Hung Urinal Screens: Manufacturer's standard thickness, but not less than 0.030 inch (0.76 mm).
G. Pilaster Shoes and Sleeves (Caps): Stainless-steel sheet, not less than 0.031-inch (0.79-mm) nominal thickness and 3 inches (76 mm) high, finished to match hardware.
H. Brackets (Fittings):
1. Stirrup Type: Ear or U-brackets; Manufacturer's standard chrome-plated zamac or stainless steel.
I. Steel Sheet Finish: Manufacturer's standard baked-on epoxy, powder-coated finish.
1. Color: As selected by Architect from manufacturer's full range or indicated on Drawings.

2.3 HARDWARE AND ACCESSORIES
A. Hardware and Accessories: Manufacturer's standard operating hardware and accessories.
1. Material: Chrome-plated zamac or stainless steel.
2. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
B. Overhead Bracing (where indicated): Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel compatible with related materials.

2.4 FABRICATION
A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories, and solid blocking within panel where required for attachment of toilet accessories.
B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
C. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
D. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION
A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position indicated with manufacturer's recommended anchoring devices.
1. Maximum Clearances:
a. Pilasters and Panels: 1/2 inch (13 mm).
b. Panels and Walls: 1 inch (25 mm).
2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.
a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
b. Align brackets at pilasters with brackets at walls.
3. Urinal: Full-Height (Continuous) 'T' Brackets: Secure panels to walls and to pilasters with full-height brackets.
a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
b. Align brackets at pilasters with brackets at walls.

3.2 ADJUSTING
A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

END OF SECTION 102113

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
1. Public-use washroom accessories.
2. Warm-air dryers.
3. Underlavatory guards.

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.

1.3 CLOSEOUT SUBMITTALS
A. Maintenance data.

1.4 COORDINATION
A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 MATERIALS
A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.
B. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.
C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.
D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
H. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.3 PUBLIC-USE WASHROOM ACCESSORIES
A. Provide Toilet Accessories / Restroom Equipment listed on the Drawings, or approved equal.
B. Manufacturers: Subject to compliance with requirements, provide products by one of the following as:
a. Bobrick Washroom Equipment, Inc.
b. Bradley Corporation.
c. Grainger.
d. Truebro.
e. Dyson (hand dryers)
f. Koala Kare Products

2.4 FABRICATION
A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

END OF SECTION 102800

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NOT FOR CONSTRUCTION

PROPOSED RETAIL BUILDING
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REDWOOD CITY, CA 94063

DRAWINGS AND SPECIFICATIONS AND THE CONCEPTS EMBEDDED WITHIN THEM CONSTITUTE THE ORIGINAL UNPUBLISHED WORK. M I ARCHITECTS, INC. DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF DISCLOSURE OF PROFESSIONAL SERVICE AND REMAIN THE PROPERTY OF THE ARCHITECT. THE USE, DUPLICATION OR DISCLOSURE OF THE DOCUMENTS WITHOUT EXPRESSED WRITTEN CONSENT FROM M I ARCHITECTS, INC. IS PROHIBITED.

LICENSED ARCHITECT
MUTHANA ISMAIL IBRAHIM
C-29627
6/30/2025
RENEWAL DATE
STATE OF CALIFORNIA

-	ISSUED FOR CONSTRUCTION
-	ISSUED FOR PLAN CHECK
10-21-14	ISSUED FOR PLANNING

NO.	DATE	DESCRIPTION
△-		
△		
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TECHNICAL SPECIFICATIONS

PROJECT #: 18-10002
DRAWN: EMQ CHECKED: MII
SCALE: AS NOTED DATE: 04-19-23

SP.7

SHEET OF

CONCRETE EXPOSURE REQUIREMENTS

ACI 318-19 TABLE 19.3.1.1 - EXPOSURE CATEGORIES AND CLASSES			
CATEGORY	CLASS	CONDITION	
F FREEZING AND THAWING	F0	CONCRETE NOT EXPOSED TO FREEZING-AND-THAWING CYCLES	
	F1	CONCRETE EXPOSED TO FREEZING-AND-THAWING CYCLES WITH LIMITED EXPOSURE TO WATER	
	F2	CONCRETE EXPOSED TO FREEZING-AND-THAWING CYCLES WITH FREQUENT EXPOSURE TO WATER	
	F3	CONCRETE EXPOSED TO FREEZING-AND-THAWING CYCLES WITH FREQUENT EXPOSURE TO WATER AND EXPOSURE TO DEICING CHEMICALS	
S SULFATE		WATER SOLUBLE SULFATE (SO_4^{2-}) IN SOIL, PERCENT BY WEIGHT	DISSOLVED SULFATE (SO_4^{2-}) IN WATER, PPM
	S0	$SO_4^{2-} < 0.10$	$SO_4^{2-} < 150$
	S1	$0.10 \leq SO_4^{2-} < 0.20$	$150 \leq SO_4^{2-} < 1500$ OR SEAWATER
	S2	$0.20 \leq SO_4^{2-} \leq 2.0$	$1500 \leq SO_4^{2-} \leq 10{,}000$
	S3	$SO_4^{2-} > 2.00$	$SO_4^{2-} > 10{,}000$
W IN CONTACT WITH WATER	W0	CONCRETE DRY IN SERVICE CONCRETE IN CONTACT WITH WATER AND LOW PERMEABILITY IS NOT REQUIRED	
	W1	CONCRETE IN CONTACT WITH WATER AND LOW PERMEABILITY IS NOT REQUIRED	
C CORROSION PROTECTION OF REINFORCEMENT	C0	CONCRETE DRY OR PROTECTED FROM MOISTURE	
	C1	CONCRETE EXPOSED TO MOISTURE BUT NOT TO EXTERNAL SOURCES OF CHLORIDES	
	C2	CONCRETE EXPOSED TO MOISTURE AND AN EXTERNAL SOURCE OF CHLORIDES FROM DEICING CHEMICALS, SALT, BRACKISH WATER, SEAWATER, OR SPRAY FROM THESE SOURCES	

ACI 318-19 TABLE 19.3.2.1 - REQUIREMENTS FOR CONCRETE BY EXPOSURE CLASS						
EXPOSURE CLASS	MAX W/CM	MIN f'c	ADDITIONAL MINIMUM REQUIREMENTS			
			AIR CONTENT			LIMITS ON CEMENTITIOUS MATERIALS
F0	N/A	2500	N/A			N/A
F1	0.55	3500	PER TABLE 19.3.3.1			N/A
F2	0.45	4500	PER TABLE 19.3.3.1			N/A
F3	0.40 (2)	5000 (2)	PER TABLE 19.3.3.1			26.4.2.2(b)
			CEMENTITIOUS MATERIALS - TYPES			CALCIUM CHLORIDE ADMIXTURE
			ASTM C150	ASTM C595	ASTM C1157	
S0	N/A	2500	NO TYPE RESTRICTION	NO TYPE RESTRICTION	NO TYPE RESTRICTION	NO RESTRICTION
S1	0.50	4000	II (4,5)	TYPES IP, IS, OR IT WITH (MS) DESIGNATION	MS	NO RESTRICTION
S2	0.45	4500	V (5)	TYPES IP, IS, OR IT WITH (HS) DESIGNATION	HS	NOT PERMITTED
S3	0.45	4500	V PLUS POZZOLAN OR SLAG CEMENT (6)	TYPES IP, IS, OR IT WITH (HS) DESIGNATION PLUS POZZOLAN OR SLAG CEMENT (6)	HS PLUS POZZOLAN OR SLAG CEMENT (6)	NOT PERMITTED
W0	N/A	2500	NONE			
W1	0.50	4000	NONE			
			MAXIMUM WATER SOLUBLE CHLORIDE ION (CL^-) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT (7)		ADDITIONAL PROVISIONS	
			NON-PRESTRESSED-ISSUED CONCRETE	PRESTRESSED CONCRETE		
CO	N/A	2500	1.00	0.06	NONE	
C1	N/A	2500	0.30	0.06		
C2	0.40	5000	0.15	0.06	CONCRETE COVER (8)	

1. THE MAXIMUM W/CM LIMITS IN TABLE 19.3.2.1 DO NOT APPLY TO LIGHTWEIGHT CONCRETE.
2. FOR PLAIN CONCRETE, THE MAXIMUM W/CM SHALL BE 0.45 AND THE MINIMUM f'c SHALL BE 4,500 PSI.
3. ALTERNATIVE COMBINATIONS OF CEMENTITIOUS MATERIALS TO THOSE LISTED IN TABLE 19.3.2.1 ARE PERMITTED WHEN TESTED FOR SULFATE RESISTANCE AND MEETING THE CRITERIA IN 26.4.2.2(c).
4. FOR SEAWATER EXPOSURE, OTHER TYPES OF PORTLAND CEMENTS WITH TRI-CALCIUM ALUMINATE (C_3A) CONTENTS UP TO 10 PERCENT ARE PERMITTED IF THE W/CM DOES NOT EXCEED 0.40.
5. OTHER AVAILABLE TYPES OF CEMENT SUCH AS TYPE I OR TYPE III ARE PERMITTED IN EXPOSURE CLASSES S1 OR S2 IF THE C_3A CONTENTS ARE LESS THAN 8 PERCENT FOR EXPOSURE CLASS S1 OR LESS THAN 5 PERCENT FOR EXPOSURE CLASS S2.
6. THE AMOUNT OF THE SPECIFIC SOURCE OF THE POZZOLAN OR SLAG CEMENT TO BE USED SHALL BE AT LEAST THE AMOUNT THAT HAS BEEN DETERMINED BY SERVICE RECORD TO IMPROVE SULFATE RESISTANCE WHEN USED IN CONCRETE CONTAINING TYPE V CEMENT. ALTERNATIVELY, THE AMOUNT OF THE SPECIFIC SOURCE OF THE POZZOLAN OR SLAG CEMENT TO BE USED SHALL BE AT LEAST THE AMOUNT TESTED IN ACCORDANCE WITH ASTM C1012 AND MEETING THE CRITERIA IN 26.4.2.2(c).
7. WATER-SOLUBLE CHLORIDE ION CONTENT THAT IS CONTRIBUTED FROM THE INGREDIENTS INCLUDING WATER, AGGREGATES, CEMENTITIOUS MATERIALS, AND ADMIXTURES SHALL BE DETERMINED ON THE CONCRETE MIXTURE BY ASTM C1218 AT AGE BETWEEN 28 AND 42 DAYS.
8. CONCRETE COVER SHALL BE IN ACCORDANCE WITH 20.6.

CONCRETE REQUIREMENTS					
SULFATE EXPOSURE (EXPOSURE CLASS)	WATER SOLUBLE SULFATE (SO4) IN SOIL, PERCENTAGE BY WEIGHT	SULFATE (SO4) IN WATER, PPM	CEMENT TYPE	MAX W/C RATIO	MIN CONCRETE STRENGTH, f'c
NEGLIGIBLE (S0)	0.00-0.10	0-150	II OR V	0.65	3,000
MODERATE (S1)	0.10-0.20	150-1,500	II OR V	0.50	4,000
SEVERE (S3)	0.20-2.00	1,500-1,0000	V	0.45	4,500
VERY SEVERE (S4)	OVER 2.00	OVER 10,000	V PLUS POZZOLAN^2	0.45	4,500

NOTES:
1. A LOWER W/C RATIO OR HIGHER STRENGTH MAY BE REQUIRED FOR LOW PERMEABILITY OR FOR PROTECTION AGAINST CORROSION OF EMBEDDED ITEMS OR FREEZING AND THAWING PER ACI 318 TABLE 19.3.2.1.
2. THE AMOUNT OF THE SPECIFIC SOURCE OF THE POZZOLAN OR SLAG CEMENT TO BE USED SHALL BE AT LEAST THE AMOUNT THAT HAS BEEN DETERMINED BY SERVICE RECORD TO IMPROVE SULFATE RESISTANCE.
3. CONCRETE EXPOSURE CLASSES FOR THE CONCRETE STRENGTHS NOTED ABOVE ARE PERMITTED TO BE F0, W0, C0, & C1. IF ANY OTHER EXPOSURE CLASSES ARE PRESENT, THE MIN CONCRETE STRENGTH SHALL BE 5,000 PSI AND THE MAX W/C RATIO SHALL BE 0.40.

EARTHWORK AND FOUNDATIONS

1. GEOTECHNICAL REPORT: PERFORM SOILS WORK COMPLYING WITH FOUNDATION DESIGN BASED ON RECOMMENDATIONS IN SOILS REPORT. SEE STRUCTURAL COVER SHEET FOR SOILS REPORT NUMBER AND DATE.

2. ALLOWABLE FOUNDATION DESIGN VALUES PER GEOTECHNICAL REPORT: VALUES BELOW MAY BE INCREASED 33 PERCENT FOR TRANSIENT LOADING.
   A. BEARING CAPACITY: SEE PROJECT DESIGN CRITERIA
   B. PASSIVE LATERAL BEARING PRESSURE: SEE PROJECT DESIGN CRITERIA
   C. COEFFICIENT OF FRICTION: SEE PROJECT DESIGN CRITERIA

3. GRADING, EXCAVATIONS, BACKFILL AND COMPACTION OF BACKFILL: COMPLY WITH GEOTECHNICAL REPORT AND REQUIREMENTS OF GOVERNING CODE AUTHORITY AND PERFORMED ONLY UNDER CONTINUOUS SPECIAL INSPECTION OF GEOTECHNICAL ENGINEER.

4. PREPARATION OF SOIL UNDER BUILDING PAD: SEE GEOTECHNICAL REPORT FOR OVER-EXCAVATION OF EXISTING SOIL AND INSTALLATION OF PROPERLY COMPACTED BACKFILL.

5. FOUNDATION EXCAVATIONS: FOUNDATIONS ARE TO BEAR ON FIRM EXISTING SOIL OR APPROVED COMPACTED FILL AS INDICATED IN GEOTECHNICAL REPORT. EXCAVATIONS ARE TO BE INSPECTED BY GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL AND FORMWORK. ENSURE EXCAVATIONS ARE CLEANS, DRY AND FREE OF DEBRIS OR LOOSE SOIL. SLOPE SIDES OF EXCAVATION NOT LESS THAN MINIMUM SLOPE INDICATED IN GEOTECHNICAL REPORT. CAST CONCRETE DIRECTLY AGAINST EXCAVATED SURFACES.

6. BACKFILLING OF RETAINING WALLS: PLACE AFTER COMPLETION AND INSPECTION OF WATERPROOFING. ADEQUATELY SHORE RETAINING WALLS DURING BACKFILL OPERATION. UNLESS ADEQUATELY SHORED, DO NOT PLACE BACKFILL BEHIND BUILDING STRUCTURE RETAINING WALLS (EXCLUDING SITE RETAINING WALLS) UNTIL CONCRETE AT ELEVATED FLOOR LEVELS ADJACENT TO WALLS ARE COMPLETELY POURED (IN AREA) AND HAVE CURED FOR AT LEAST 7 DAYS.

7. WATER EXPOSURE AT BUILDING PERIMETER FOOTINGS: AT AREAS WHERE SIDEWALKS OR PAVING DO NOT IMMEDIATELY ADJOIN STRUCTURE, PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURE AT BUILDING PERIMETER. LANDSCAPE IRRIGATION IS NOT PERMITTED WITHIN FIVE FEET OF BUILDING PERIMETER FOOTINGS EXCEPT WHEN ENCLOSED IN PROTECTED PLANTERS WITH DIRECT DRAINAGE AWAY FROM STRUCTURE OR WHICH COMPLIES WITH APPLICABLE CODE. DISCHARGE FROM DOWN SPOUTS, ROOF DRAINS AND SCUPPERS IS NOT PERMITTED ONTO UNPROTECTED SOILS WITHIN FIVE FEET OF BUILDING PERIMETER. REFER TO GEOTECHNICAL REPORT FOR COMPLETE REQUIREMENTS.

CONCRETE

1. CONCRETE COMPRESSIVE STRENGTH: ALL CONCRETE SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH AS SHOWN IN THE TABLE 2 BELOW AT 28 DAYS, U.N.O. ON PLANS. SEE ALSO SULFATE CONTENT NOTES.

2. AGGREGATES IN CONCRETE: SHALL BE NATURAL SAND AND ROCK (150 LB/CU. FT) CONFORMING TO ASTM C33. AGGREGATE SHALL HAVE PROVEN SHRINKAGE CHARACTERISTICS OF LESS THAN 0.04% PER ASTM C-157. DO NOT CHANGE SOURCE OF AGGREGATE DURING COURSE OF WORK WITHOUT WRITTEN CONSENT OF ENGINEER.

3. CEMENT: SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150. CEMENT SHALL BE TYPE II OR AS REQUIRED TO SATISFY SITE SOIL CONDITIONS. REFER TO TABLE 4 FOR CONCRETE CEMENT REQUIREMENTS ON SOIL CONTAINING SULFATE. REFER TO TABLE 2 FOR MAXIMUM WATER TO CEMENT RATIO.

CONCRETE STRENGTH			
CONDITION	STRENGTH, f'c		
SLAB ON GRADE	2,500 PSI		
FOOTING & GRADE BM	2,500 PSI		
MAT SLAB (CARWASH ONLY)	2,500 PSI		

4. REBAR CLEAR COVER IN CONCRETE: THE FOLLOWING MINIMUM CLEAR DISTANCES BETWEEN REINFORCING STEEL AND FACE OF CONCRETE SHALL BE MAINTAINED UNLESS NOTED OTHERWISE:

REBAR CLEAR COVER FOR CAST-IN-PLACE CONCRETE MEMBERS			
CONCRETE EXPOSURE	MEMBER	REINFORCEMENT	SPECIFIED COVER
SLAB ON GRADE	ALL	ALL	CENTER OF SLAB OR 2" MIN
CONCRETE AGAINST & PERMANENTLY IN CONTACT WITH GROUND:	ALL	ALL	3"
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	No. 6 THROUGH No. 18 BARS	2"
		No. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1-1/2"
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLABS, JOISTS, AND WALLS	No. 14 AND No. 18 BARS	1-1/2"
		No. 11 BAR AND SMALLER	$\frac{3}{4}$"
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINFORCEMENT, STIRRUPS, TIES, SPIRALS, AND HOOPS	1-1/2"

5. VIBRATION: VIBRATION OF CONCRETE SHALL BE IN ACCORDANCE WITH GENERAL PROVISIONS OUTLINED IN PORTLAND CEMENT ASSOCIATION SPECIFICATION ST26.

6. CURING: CONCRETE SHALL BE MAINTAINED AT IN A MOIST CONDITION FOR A MINIMUM OF FIVE DAYS AFTER ITS PLACEMENT. FOR CONCRETE OTHER THAN SLAB ON GRADE, APPROVED CURING COMPOUNDS MAY BE USED IN LIEU OF MOIST CURING. ONLY IF APPROVED BY THE ENGINEER OR ARCHITECT.

7. INSPECTIONS, TESTING & QUALITY ASSURANCE: REFER TO STRUCTURAL NOTE SHEETS FOR DEPUTY SPECIAL INSPECTION, TESTING & STRUCTURAL OBSERVATION REQUIREMENTS. A MINIMUM OF ONE COMPRESSION TEST AT 7 DAYS AND 2 TESTS AT 28 DAYS FOR ALL CONCRETE SAMPLES. TAKE TEST AT A FREQUENCY OF ONCE EVERY 150 CU. YDS OR 5,000 SQ. FT MINIMUM.

8. ANCHOR BOLTS, DOWELS, INSERTS: SHALL BE TIED IN PLACE PRIOR TO POURING CONCRETE.

9. CONSTRUCTION AND POUR JOINTS: LOCATIONS SHALL BE APPROVED BY ENGINEER PRIOR TO POURING CONCRETE.

10. FLY ASH: SHALL NOT BE USED IN CONCRETE.

11. FORMWORK: FORMWORK TOLERANCE SHALL IN ACCORDANCE WITH THE C.B.C. AND A.C.I. STANDARDS.

12. HOT AND COLD WEATHER CONCRETING:
    A. HOT WEATHER CONCRETING: WHEN AIR TEMPERATURE RISES ABOVE 80° F AND HUMIDITY FALLS BELOW 25, THE CONTRACTOR SHALL FOLLOW HOT WEATHER CONCRETING IN ACCORDANCE WITH ACI 305 5-77. CONTRACTOR SHALL BE PREPARED TO USE FOG SPRAY OR OTHER PRECAUTIONS ACCEPTABLE TO ARCHITECT WHEN RATE OF EVAPORATION EQUALS OR EXCEEDS 0.2 POUNDS PER SQUARE FOOT PER HOUR.
    B. COLD WEATHER CONCRETING: ADEQUATE EQUIPMENT SHALL BE PROVIDED FOR HEATING CONCRETE MATERIALS AND PROTECTING CONCRETE DURING FREEZING OR NEAR FREEZING WEATHER. ALL CONCRETE MATERIALS AND ALL REINFORCEMENT, FORMS FILLERS AND GROUND WITH WHICH THE CONCRETE IS TO CONTACT SHALL BE FREE FROM FROST. FROZEN MATERIAL OR MATERIALS CONTAINING ICE SHALL NOT BE USED. COLD WEATHER CONCRETING SHALL BE DONE IN ACCORDANCE WITH ACI 306 R-78. (LATEST EDITION)

13. PIPES IN CONCRETE: PIPES MAY PASS THROUGH STRUCTURAL CONCRETE IN SLEEVES, BUT SHALL NOT BE EMBEDDED THEREIN. PIPES OR DUCTS EXCEEDING ONE-THIRD THE SLAB OR WALL THICKNESS SHALL NOT BE PLACED IN THE STRUCTURAL CONCRETE UNLESS SPECIFICALLY DETAILED.

14. EXPOSED CORNERS: PROVIDE 3/4" CHAMFERS AT ALL EXPOSED CORNERS.

15. ARCHITECTURAL DETAILS: REFER TO ARCHITECTURAL DRAWINGS FOR REVEALS, AREAS OF TEXTURED CONCRETE OR SPECIAL FINISHES, ITEMS REQUIRED TO BE CAST INTO THE CONCRETE, CURBS AND SLAB DEPRESSIONS.

16. DRYPACK OR GROUT: SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI AND BE COMPOSED OF ONE PART PORTLAND CEMENT TO NOT MORE THAN THREE PARTS SAND.

ABBREVIATIONS	
#	NUMBER OR POUND
&	AND
(E)	EXISTING
@	AT
±	APPROXIMATE
A/C UNIT	AIR CONDITIONING UNIT
A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ABC	AGGREGATE BASE COURSE
ABV	ABOVE
ACCU	AIR COOLED CONDENSING UNIT
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
ADDM	ADDUNDUM
ADJ	ADJACENT
ADMIN	ADMINISTRATION
AFF	ABOVE FINISH FLOOR
AHR	ANCHOR
AHU	AIR HANDLING UNIT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALNMT	ALIGNMENT
ALT	ALTERNATE
ALUM	ALUMINUM
ANG BM	ANGLE BEAM
APA	AMERICAN PLYWOOD ASSOCIATION
APPD	APPROVED
APPROX	APPROXIMATE
AR	AS REQUIRED
ARCH	ARCHITECTURAL
ASD	ALLOWABLE STRESS DESIGN
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATC	ACOUSTICAL TILE CEILING
ATCH	ATTACHMENT
ATS	ANCHOR TIEDOWN SYSTEM
AUX	AUXILIARY
AV	AIR VENT
AW	ACTUAL WEIGHT
AWA	ALIGN WITH ABOVE
AWN	AWNING
AWS	AMERICAN WELDING SOCIETY
BOW	BOTTOM OF WALL
B/B	BACK TO BACK
BAL	BALANCE
BALC	BALCONY
BC	BACK OF CURB
BD	BOARD
BDRY	BOUNDARY
BEV	BEVEL
BEW	BOTTOM EACH WAY
BITUM	BITUMINOUS
BKG	BACKING
BKGD	BACKGROUND
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BLST	BALLAST
BLW	BELOW
BM	BEAM
BMU	BRICK MASONRY UNIT
BN	BOUNDARY NAILING
BOB	BOTTOM OF BEAM
BOT	BOTTOM
BP	BASE PLATE
BRB	BUCKLING RESISTING BRACE
BRCG	BRACING
BRDG	BRIDGING
BRG	BEARING
BS	BOUNDARY SCREWS
BSMT	BASEMENT
BTM	BOTTOM
BTR	BETTER
BTWN	BETWEEN
CAM	CAMBER
CANT	CANTILEVER
CBC	CALIFORNIA BUILDING CODE
CD	CONSTRUCTION DOCUMENTS
CIP	CAST IN PLACE
CJ	CONSTRUCTION JOINT OR CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLDG	CLADDING
CLG	CEILING
CLL	COLUMN LINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CNTOR	CONTRACTOR
COL	COLUMN
CON	CONNECTION
CONC	CONCRETE
CONCL	CONCEALED
COND	CONDITION
CONT	CONTINUOUS
CORR	CORRIDOR
C'SINK	COUNTERSINK
CTRD	CENTERED
CVIF	CONTRACTOR TO VERIFY IN FIELD
DB	DROP BEAM
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEMO	DEMOLISH
DEPT	DEPARTMENT
DET	DETAIL
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTRIBUTED
DJ	DECK JOIST
DL	DEAD LOAD
DN	DOWN
DP	DEEP
DR	DROP
DWG	DRAWING
EA	EACH
ED	EDGE DISTANCE
EF	EACH FACE
EI	EXPANSION INDEX
ELE	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMBED	EMBEDMENT
EN	EDGE NAILING
ENC	ENCLOSURE
EOS	EDGE OF SLAB
EQ	EQUAL
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
ES	EDGE SCREWS
EW	EACH WAY
EWB	ENGINEERED WOOD BEAM
EWC	ELECTRICAL WATER COOLER
EXIST	EXISTING
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXPO	EXPOSED
EXT	EXTERIOR
EXT GR	EXTERIOR GRADE
F/	FACE OF
FA	FROM ABOVE
FAS BD	FASCIA BOARD
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FINISHED FLOOR
FFA	FROM FLOOR ABOVE
FFB	FROM FLOOR BELOW
FG	FINISHED GRADE
FH	FULL HEIGHT
FHS	FLAT HEAD SCREWS
FIN	FINISH
FJ	FLOOR JOIST
FL	FLUSH
FLNG	FLANGE
FLMT	FLUSH MOUNT
FLR	FLOOR
FNGR	FINGER
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FRMG	FRAMING
FRP	FIBERGLASS REINFORCED PLASTIC
FSTNR	FASTENER
FT	FEET
FTG	FOOTING
FU	FULL SIZE
FURR	FURRING
FW	FIRE WALL
GA	GAUGE
GALV	GALVANIZED
GLB	GLU-LAM
GLZ	GLAZING
GR	GRADE
GR BM	GRADE BEAM
GR WT	GROSS WEIGHT
GRTG	GRATING
GRV	GROOVE
GT	GIRDER TRUSS
GYP	GYPSUM
GYP-CRETE	GYPSUM CONCRETE
HC	HOLLOW CORE
HD	HEAVY DUTY
HDR	HEADER
HDWR	HARDWARE
HF	HEM-FIR
HGR	HANGER
HGT	HEIGHT
HLDN	HOLDOWN
HORZ	HORIZONTAL
HP	HIGH POINT
HS	HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SECTION OR TUBE STEEL
HT	HEIGHT
HVY	HEAVY
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IN	INCH
INFO	INFORMATION
INSTL	INSTALL
INSUL	INSULATION
INT	INTERIOR
JNT	JOINT
JST	JOIST
k	KIPS
KSP	KIPS PER SQUARE FOOT
KWY	KEYWAY
L	ANGLE
LAM	LAMINATE
LAT	LATTICE
LF	LINEAR FOOT
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONGIT	LONGITUDINAL
LP	LOW POINT
LSL	LAMINATED STRAND LUMBER
LT WT	LIGHT WEIGHT
LVL	LAMINATED VENEER LUMBER
MAS	MASONRY OPENING
MAX	MAXIMUM
MB	MACHINE BOLTS
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MIRR	MIRROR
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MOD	MODULE
MTD	MOUNTED
MTRL	MATERIAL
MULT	MULTIPLE
N/A	NOT APPLICABLE
N/P	NOT PROVIDED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
ø	DIAMETER
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHANG
OMF	ORDINARY MOMENT FRAME
OPEN	OPENING
OPP	OPPOSITE
OWSJ	OPEN WEB STEEL JOIST
OWWJ	OPEN WEB WOOD JOIST
PAF	POWER ACTUATED FASTENER
PC	PRE-CAST
PERF	PERFORATED
PERP	PERPENDICULAR
PI	PLASTICITY INDEX
PL	PLATE
PLAS	PLASTER
PLBG	PLUMBING
PLYWD	PLYWOOD
PNL	PANEL
PJP	PARTIAL JOINT PENETRATION
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSL	PARALLEL STRAND LUMBER
PT	PRESSURE TREATED
P-T	POST TENSIONED
PTD	PAINTED
PUR	PURLINS
PVC	POLYVINYL CHLORIDE
RC	REINFORCED CONCRETE
RD	ROOF DRAIN
REBAR	REINFORCING STEEL BARS
REF	REFERENCE
REINF	REINFORCEMENT
REP	REPAIR
REPL	REPLACE
REQ'D	REQUIRED
RET	RETAINING
REV	REVISION
RF	ROOF
RFG	ROOFING
RFI	REQUEST FOR INFORMATION
RM	ROOM
RO	ROUGH OPENING
RR	RR
SAD	SEE ARCHITECTURAL DRAWINGS
SCB	SPECIAL CONCENTRIC BRACED
SCHD	SCHEDULE
SECT	SECTION
SHTG	SHEATHING
SIM	SIMILAR
SMF	SPECIAL MOMENT FRAME
SMS	SHEET METAL SCREWS
SN	STRUCTURAL NOTE
SOG	SLAB ON GRADE
SPEC	SPECIFICATIONS
SPF	SPRUCE PINE FIR
SPN	SOLE PLATE NAILING
SQ	SQUARE
SQSH	SQUASH
SR	STUD RAIL
SS	STANDING SEAM
SSK	STRUCTURAL SKETCH
SST	STAINLESS STEEL
STAGG	STAGGER
STD	STANDARD
STIFF	STIFFENER
STIR	STIRRUP
STL	STEEL
STL LNTL	STEEL LINTEL
STRUCT	STRUCTURAL
STS	SELF TAPPING SCREWS
SUPPL	SUPPLEMENTAL
SURF	SURFACE
SUSP	SUSPENDED
SW	SHEAR WALL
SWWJ	SOLID WEB WOOD JOIST
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TBA	TO BEAM ABOVE
TBB	TO BEAM BELOW
TC	TOP OF CURB
TC AX LD	TOP CHORD AXIAL LOAD
TCX	TOP CHORD EXTENSION
TDS	TIE DOWN SYSTEM
TEMP	TEMPORARY
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
THK	THICK
THKND	THICKENED
THRD	THREADED
THRU	THROUGH
TOB	TOP OF BEAM
TOF	TOP OF FOOTING
TOJ	TOP OF JOIST
TOS	TOP OF STEEL
TOT	TOP OF TRUSS
TOW	TOP OF WALL
TP	TOP PLATE
TRANSV	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
URM	UNREINFORCED MASONRY UNIT
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WIDE
W/	WITH
W/O	WITHOUT
WD	WOOD
WDW	WINDOW
WF	WIDE FLANGE
WHS	WELDED HEADED STUD
WL	WIND LOAD
WLD	WELDED
WO	WHERE OCCURS
WP	WORKING POINT
WPM	WATER PROOF MEMBRANE
WR	WEATHER RESISTANCE
WT	WEIGHT
WWM	WELDED WIRE MESH
XBRA	CROSS BRACING

GENERAL NOTES

1. FIELD VERIFICATION: FIELD VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO CONSTRUCTION. PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER) IN CASE OF DISCREPANCIES.

2. DESIGN INTENT: CONTRACT DOCUMENTS INDICATE DESIGN INTENT FORE STRUCTURE IN ITS COMPLETED STATE. THEY DO NOT INDICATE METHOD OF CONSTRUCTION. PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER), PRIOR TO PROCEEDING WITH WORK, IF DESIGN INTENT REQUIRES FURTHER CLARIFICATION.

3. DEVIATIONS, MODIFICATIONS AND SUBSTITUTIONS TO APPROVED STRUCTURAL DRAWINGS: MUST BE ACCEPTED IN WRITING BY ARCHITECT (STRUCTURAL ENGINEER) AND APPROVED BY GOVERNING CODE AUTHORITY. NO DEVIATION, MODIFICATION OR SUBSTITUTION WILL BE ACCEPTED VIA SHOP DRAWING REVIEW.

4. PROCEDURES OF CONSTRUCTION: CONTRACTOR IS RESPONSIBLE FOR PROCEDURES OF CONSTRUCTION COMPLYING WITH NATIONAL, STATE AND LOCAL SAFETY ORDINANCES. SITE VISITS (INCLUDING STRUCTURAL OBSERVATION) BY ARCHITECT (STRUCTURAL ENGINEER) DO NOT CONSTITUTE SUPERVISIONS OF METHODS OF CONSTRUCTION.

   A. PROTECTION OF UTILITIES: LOCATE EXISTING UTILITIES, INCLUDING THOSE NOT SHOWN ON CONTRACT DOCUMENTS, AND PROTECT THEM FROM DAMAGE. CONTRACTOR BEARS EXPENSE OF REPAIR OR REPLACEMENT OF UTILITIES IN CONJUNCTION WITH EXECUTION OF WORK.

   B. EXCAVATIONS: PROTECT STRUCTURE, ADJACENT STRUCTURES, ADJACENT PROPERTIES, STREETS, AND UTILITIES DURING EXCAVATION UTILIZING LAGGING, SHORING, UNDERPINNING AT SIDES AND RELATED PROCEDURES AS MAY BE REQUIRED. PROVIDE NECESSARY SUPPORTS FOR SOIL EXCAVATIONS. CONTRACTOR AND AFFECTED TRADES SHALL REFER TO GEOTECHNICAL REPORT FOR MORE INFORMATION.

   C. PROTECTION OF STRUCTURE: PROVIDE NECESSARY MEASURES TO PROTECT STRUCTURE DURING EXECUTION OF WORK.

   D. CONTRACTOR PROPOSED REVISIONS: WHERE A REVISION OF STRUCTURAL DESIGN OR CONNECTION IS PROPOSED BY CONTRACTOR TO ACCOMMODATE CONSTRUCTION TOLERANCES, CONSTRUCTION SEQUENCE AND/OR DIMENSION MODIFICATIONS, CONTRACTOR SHALL RETAIN A STRUCTURAL ENGINEER LICENSED IN STATE OF CALIFORNIA TO PERFORM DESIGN. SUBMIT STAMPED AND SIGNED DESIGN DRAWINGS AND CALCULATIONS TO THE ARCHITECT (STRUCTURAL ENGINEER) FOR REVIEW AND THE GOVERNING CODE AUTHORITY FOR APPROVAL.

   E. ERECTION PLANS: DETERMINE PHASES OF WORK REQUIRING ERECTION PLANS ACCORDING TO APPLICABLE SAFETY REGULATIONS. MAINTAIN CERTIFIED COPIES OF ERECTION PLANS AT SITE DURING CONSTRUCTION.

   F. SHORING, BRACING, AND OTHER TEMPORARY SUPPORTS: DESIGN AND ERECT SHORING, BRACING, AND OTHER TEMPORARY SUPPORTS WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH AND AS REQUIRED FOR SAFE ERECTION. ENSURE FLOOR, ROOF, AND WALL MEMBERS ARE SECURELY SHORED AND BRACED DURING CONSTRUCTION. PROVIDE SHORING AT ELEVATED BEAMS AND SLABS SUPPORTING CONCRETE OR MASONRY WALLS DURING AND AFTER WALL POUR UNTIL WALL ATTAINS DESIGN STRENGTH.

   G. TEMPORARY LOADING: ENSURE CONSTRUCTION LOADS DO NOT EXCEED INDICATED DESIGN LIVE LOAD VALUES. NOTIFY AFFECTED SUB-CONTRACTOR TRADES OF THESE DESIGN LOAD LIMITS.

   H. FABRICATION, SHIPMENT, AND ERECTION OF STRUCTURAL STEEL: ENSURE STRESSES OCCURRING DURING FABRICATION, SHIPMENT, AND ERECTION OF STRUCTURAL STEEL ARE TEMPORARY AND ARE LESS THAN DESIGN AND ALLOWABLE STRESS CAPACITIES OF INDIVIDUAL MEMBERS. DO NOT IMPAIR FULL DESIGN AND LOAD CARRYING CAPACITY OF MEMBERS DUE TO FABRICATION, SHIPMENT, OR ERECTION. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING ERECTION SEQUENCE, ERECTION PROCEDURE, TEMPERATURE DIFFERENTIALS AND WELD SHRINKAGE TO MINIMIZE RESIDUE STRESSES. PROVIDE ADDITIONAL MATERIALS FOR THE ERECTION OF STRUCTURAL STEEL SUCH AS TEMPORARY BRACING AND GUY CABLES AS MAY BE NECESSARY AT NO ADDITIONAL COST. REMOVE THESE MATERIALS UNLESS APPROVED IN WRITING BY OWNER. DO NOT TIGHTEN BOLTS IN TYPICAL BEAM TO COLUMN CONNECTIONS FOR ERECTION PURPOSES.

   I. SECURING REINFORCING STEEL, DOWELS, ANCHOR BOLTS AND EMBEDS: FIRMLY SUPPORT AND ACCURATELY PLACE COMPLYING WITH ACI STANDARDS PRIOR TO CASTING CONCRETE OR GROUT IN MASONRY WALLS. USE TIES AND SUPPORT BARS IN ADDITION TO REINFORCING STEEL SHOWN WHERE NECESSARY. NO WELDING OR REINFORCING STEEL, INCLUDING TACK WELDING, IS PERMITTED UNLESS OTHERWISE ACCEPTED IN WRITING BY ARCHITECT (STRUCTURAL ENGINEER). PROVIDE PLASTIC OR PLASTIC COATED CHAIRS AND SPACERS WHEN RESTING ON EXPOSED SURFACES.

5. COORDINATION RESPONSIBILITY: CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF WORK INCLUDING THAT OF SUB-CONTRACTOR TRADES.

6. SUBMITTALS: SUBMIT TO ARCHITECT (STRUCTURAL ENGINEER) AS INDICATED ON STRUCTURAL DRAWINGS AND SPECIFICATIONS. GENERAL CONTRACTOR SHALL REVIEW SUBMITTAL FOR COMPLETENESS AND COMPLIANCE WITH CONTRACT DOCUMENTS PRIOR TO SUBMISSION.

   A. REQUEST FOR INFORMATION (RFI) SUBMITTALS: ACCOMPANY RFI'S WITH PARTIAL STRUCTURAL FOUNDATION OR FRAMING PLANS SHOWING LOCATION IN QUESTION AND AFFECTED STRUCTURAL MEMBERS. COPY PARTIAL PLAN FROM STRUCTURAL DRAWINGS AND INDICATE GRID LINE LOCATIONS AND FLOOR LEVEL. ALSO PROVIDE PROPERLY DRAWN ENGINEERING SKETCHES ILLUSTRATING ISSUES AND CONTRACTOR'S PROPOSED SOLUTIONS. PHOTOGRAPHS ARE NOT ACCEPTABLE SUBSTITUTES TO ENGINEERING SKETCHES.

7. CONTRACT DOCUMENTS USE: REVIEW CONTRACT DOCUMENTS IN THEIR ENTIRETY BEFORE PERFORMING STRUCTURAL RELATED WORK AND BEFORE DEVELOPING SHOP DRAWINGS. BRING DISCREPANCIES TO THE IMMEDIATE ATTENTION OF ARCHITECT (STRUCTURAL ENGINEER) BEFORE STARTING WORK.

   A. SCALING OF DRAWINGS: NOT PERMITTED.

   B. ADDITIONAL STRUCTURAL REQUIREMENTS: SEE SPECIFICATIONS.

   C. BUILDING GEOMETRY: SEE ARCHITECTURAL DRAWINGS FOR BUILDING GEOMETRY INCLUDING, BUT NOT LIMITED TO, TOP OF FLOOR AND ROOF ELEVATIONS; DEPRESSIONS; SLOPES; CURBS; DRAINS; TRENCHES; SLAB AND DECK EDGE LOCATIONS; WALL OVERALL DIMENSIONS; AND SIZE AND LOCATIONS OF OPENINGS IN FLOORS, ROOF AND WALLS.

   D. NON-STRUCTURAL ITEMS REQUIRING SPECIAL PROVISIONS: SEE ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR NON-STRUCTURAL ITEMS REQUIRING SPECIAL PROVISIONS DURING CONSTRUCTION. THEY INCLUDE, BUT ARE NOT LIMITED TO, NON-STRUCTURAL WALLS; SIZE AND LOCATIONS OF OPENINGS AND SLEEVES PENETRATING STRUCTURE; SIZE AND LOCATION OF CONCRETE CURBS AND PADS; AND SIZE AND LOCATION OF PIPING, DUCTWORK, AND EQUIPMENT ANCHORAGES MOUNTED OR SUSPENDED FROM STRUCTURE. VERIFY EXACT SIZE AND LOCATION OF EQUIPMENT WITH EQUIPMENT MANUFACTURER.

8. MATERIALS: FURNISH AND INSTALL IN COMPLIANCE WITH LEGALLY CONSTITUTED PUBLIC AUTHORITIES HAVING JURISDICTION INCLUDING COUNTY AND LOCAL ORDINANCES AND SAFETY ORDERS OF STATE INDUSTRIAL ACCIDENT COMMISSION, OSHA.

9. PENETRATIONS, EMBEDMENT, AND OPENINGS IN STRUCTURAL MEMBERS: NO PENETRATION, EMBEDMENT, OPENING, SLEEVE, PIPE, OR CONDUIT SHALL OCCUR IN STRUCTURAL MEMBERS INCLUDING FOOTINGS, SLABS, WALLS, COLUMNS, AND BEAMS UNLESS SPECIFICALLY SHOWN OR INDICATED ON STRUCTURAL DRAWINGS.

10. TYPICAL DETAILS: DETAILS ON SD SERIES SHEETS ARE APPLICABLE THROUGHOUT PROJECT WHEREVER THE DESCRIBED CONDITION OCCURS AND MAY OR MAY NOT BE SPECIFICALLY REFERENCED ON STRUCTURAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THESE DETAILS AND UNDERSTANDING EXTENT OF THEIR APPLICATION PRIOR TO PERFORMING WORK.

11. WATERPROOFING & DRAINAGE: WATERPROOFING AND DRAINAGE IS OUTSIDE INNOVATIVE STRUCTURAL ENGINEERING'S SCOPE, EXPERIENCE, AND PROFESSIONAL EXPERTISE. INNOVATIVE STRUCTURAL ENGINEERING RECOMMENDS HIRING A WATERPROOFING & DRAINAGE PROFESSIONAL. IF NO WATERPROOFING PROFESSIONAL IS HIRED, OWNER AND CONTRACTOR ASSUME RESPONSIBILITY OF ALL WATERPROOFING & DRAINAGE REQUIREMENTS. INNOVATIVE STRUCTURAL ENGINEERING ACCEPTS NO LIABILITY AND SHALL BE HELD HARMLESS FOR ALL WATERPROOFING AND DRAINAGE REQUIREMENTS.

PROJECT DESIGN CRITERIA

BUILDING CODE:	2022 CBC
LOCATION (LATITUDE / LONGITUDE):	37.4759°N / 122.2204°W
GEOTECHNICAL PARAMETERS:	
SOILS ENGINEER:	MATRISCOPE ENGINEERING LABORATORIES, INC.
REPORT NUMBER:	2567
DATE:	JANUARY 8, 2016
ALLOWABLE SOIL BEARING PRESSURE:	3000 PSF
MODULUS OF SUBGRADE REACTION:	--
ALLOWABLE PASSIVE PRESSURE:	350 PCF
SOIL FRICTION COEFFICIENT:	0.3
EXPANSION POTENTIAL:	MEDIUM
PLASTICITY INDEX:	--
LIQUEFACTION POTENTIAL:	--
TOTAL SETTLEMENT:	1"
DIFFERENTIAL SETTLEMENT POTENTIAL:	½"
CORROSIVITY:	LOW POTENTIAL TO CONCRETE HIGH POTENTIAL TO METAL
SULFATE CONTENT:	43.0PPM
CHLORIDE CONTENT:	11.5PPM
SEISMIC DESIGN PARAMETERS:	
RISK CATEGORY:	II
SITE CLASS:	D
SHORT PERIOD SPECTRAL ACCELERATION, S_S:	1.746g
1s PERIOD SPECTRAL ACCELERATION, S_1:	0.712g
SITE COEFFICIENT, F_a:	1.0
SITE COEFFICENT, F_V:	1.7
SHORT PERIOD SPECTRAL RESPONSE, S_{DS}:	1.164g
SPECTRAL RESPONSE COEFFICIENT, S_{D1}:	0.807g
SEISMIC DESIGN CATEGORY:	D
SEISMIC IMPORTANCE FACTOR, I_e:	1.0
RESPONSE MODIFICATION, R & SEISMIC FORCE RESISTING SYSTEM:	6.5 - LIGHT FRAMED SHEAR WALLS
DESIGN BASE SHEAR:	.179ρW
SEISMIC RESPONSE COEFFICIENT, C_s:	.179
DESIGN PROCEDURE:	EQUIVALENT LATERAL FORCE
REDUNDANCY FACTOR, ρ:	1.3
SYSTEM OVERSTRENGTH FACTOR, Ω:	2.5
DEFLECTION AMPLIFICATION FACTOR, C_d:	4.0
HORIZONTAL STRUCTURAL IRREGULARITIES:	TYPE 2
VERTICAL STRUCTURAL IRREGULARITIES:	NONE
WIND DESIGN PARAMETERS:	
RISK CATEGORY:	II
WIND EXPOSURE CATEGORY:	C
ULTIMATE DESIGN WIND SPEED (3-SECOND GUST), V_{ULT}:	92 MPH
NOMINAL DESIGN WIND SPEED (3-SECOND GUST), V_{ASD}:	71 MPH
INTERNAL PRESSURE COEFFICIENT, GC_{pi}:	±0.18

GRAVITY DESIGN PARAMETERS: (PSF, SERVICE LOADS)					
	DEAD	ROOF LIVE	SNOW	LIVE	TOTAL
ROOF:	15	20	-	-	35
EXTERIOR WALL:	15	-	-	-	15
INTERIOR WALL:	10	-	-	-	10

SHEET INDEX

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DS2 STRUCTURAL GENERAL FRAMING DETAILS
DS4 STRUCTURAL ROOF FRAMING DETAILS
DS4.1 STRUCTURAL ROOF FRAMING DETAILS

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PLAN REVISIONS		
DELTA	DESCRIPTION	DATE
△1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE

CHRISTIAN A. HAINDS
No. C86438
Exp. 03/31/25

DATE: 12/4/2023

SHEET TITLE:

STRUCTURAL NOTES

SHEET NUMBER:

SN1

CONVENTIONAL WOOD FRAMING REQUIREMENTS - CBC A TABLE 2304.10.2	
CONNECTION	NAILING
BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATES, TOENAIL	(3) 8d COMMON , (3) 3" x 0.131" NAILS, OR (3) 3" 14 GAGE STAPLES
BLOCKING BETWEEN RAFTERS OR TRUSS NOT AT WALL TOP PLATES, TOENAIL, EACH END	(2) 8d COMMON , (2) 3" x 0.131" NAILS, (2) 3" 14 GAGE STAPLES
BLOCKING BETWEEN RAFTERS OR TRUSS NOT AT WALL TOP PLATES, END NAIL	(2) 16d COMMON , (3) 3" x 0.131" NAILS, (3) 3" 14 GAGE STAPLES
FLAT BLOCKING TO TRUSS/WEB FILLER, FACE NAIL	16d COMMON , 3" x 0.131" NAILS, 3" 14 GAGE STAPLES @ 6" O.C.
CEILING JOIST TO TOP PLATE, EACH JOIST, TOENAIL	(3) 8d COMMON , (3) 3" x 0.131" NAILS, (3) 3" 14 GAGE STAPLES, 7/16" CROWN
CEILING JOIST, LAPS PARTITION, FACE NAIL - TABLE 2308.7.3.1	(3) 16d COMMON , (4) 3" x 0.131" NAILS, (4) 3" 14 GAGE STAPLES, 7/16" CROWN
CEILING JOISTS TO PARALLEL RAFTERS, FACE NAIL - TABLE 2308.7.3.1	PER TABLE 2308.7.3.1
COLLAR TIE TO RAFTER, FACE NAIL	(3) 10d COMMON, (4) 3" x 0.131" NAILS, OR (4) 3" 14 GAGE STAPLES
RAFTER OR ROOF TRUSS TO PLATE, TOENAIL - TABLE 2308.7.5	(3) 10d COMMON, (4) 3" x 0.131" NAILS, OR (4) 3" 14 GAGE STAPLES
ROOF RAFTER TO 2x RIDGE BEAM, END NAIL	(2) 16d COMMON, (3) 3" x 0.131" NAILS, OR (3) 3" 14 GAGE STAPLES
ROOF RAFTER TO 2x RIDGE BEAM, TOE NAIL	(3) 10d COMMON, (4) 3" x 0.131" NAILS, OR (4) 3" 14 GAGE STAPLES
STUD TO STUD (NON-BRACED WALL PANELS), 24" O.C. FACE NAIL	16d COMMON (3 ½"x 0.162")
STUD TO STUD (NON-BRACED WALL PANELS), 16" O.C. FACE NAIL	3" x 0.131" NAILS, (3) 3" 14 GAGE STAPLES
STUD TO STUD AT INTERSECTING CORNER (BRACED), 16" O.C. FACE NAIL	16d COMMON (3 ½"x 0.162")
STUD TO STUD AT INTERSECTING CORNER (BRACED), 12" O.C. FACE NAIL	3" x 0.131" NAILS, (3) 3" 14 GAGE STAPLES
BUILT-UP HEADER (2" TO 2"), 16" O.C. EACH EDGE, FACE NAIL	16d COMMON (3 ½"x 0.162")
CONTINUOUS HEADER TO STUD, TOENAIL.	(4) 8d COMMON
TOP PLATE TO TOP PLATE, 16" O.C. FACE NAIL	16d COMMON
TOP PLATE TO TOP PLATE, 12" O.C. FACE NAIL	3" x 0.131" NAILS, 3" 14 GAGE STAPLES
TOP PLATE TO TOP PLATE, AT END JOINTS, EACH SIDE OF END JOINT, FACE NAIL (MIN. 24" LAP SPLICE LENGTH EACH SIDE END JOINT)	(8) 16d COMMON, (12) 3" x 0.131" NAILS, (12) 3" 14 GAGE STAPLES
BOTTOM PLATE TO JOIST, RIM JOIST, OR BLOCKING AT NON-BRACED PANEL, 16" O.C. FACE NAIL	16d COMMON
BOTTOM PLATE TO JOIST, RIM JOIST, OR BLOCKING AT NON-BRACED PANEL, 12" O.C. FACE NAIL	3" x 0.131" NAILS, 3" 14 GAGE STAPLES
BOTTOM PLATE TO JOIST, RIM JOIST, OR BLOCKING AT BRACED PANEL, 16" O.C. FACE NAIL	(2) 16d COMMON, (4) 3" x 0.131" NAILS, (4) 3" 14 GAGE STAPLES
STUD TO TOP OR BOTTOM PLATE, TOENAIL	(4) 8d COMMON, (4) 3"x 0.131" NAILS, (4) 3" 14 GAGE STAPLES
STUD TO TOP OR BOTTOM PLATE, END NAIL	(2) 16d COMMON, (3) 3"x 0.131" NAILS, (3) 3" 14 GAGE STAPLES
TOP OR BOTTOM PLATE TO STUD, END NAIL	(2) 16d COMMON, (3) 3"x 0.131" NAILS, (3) 3" 14 GAGE STAPLES
TOP PLATES, LAP AND INTERSECTIONS, FACE NAIL.	(2) 16d COMMON , (3) 3" x 0.131" NAILS, OR (3) 3" 14 GAGE STAPLES
1" BRACE TO EACH STUD AND PLATE, FACE NAIL.	(2) 8d COMMON, (2) 3" x 0.131" NAILS, OR (2) 3" 14 GAGE STAPLES
1" x 6" SHEATHING TO EACH BEARING, FACE NAIL.	(2) 8d COMMON, (2) 3" x 0.128" NAILS
1" x 8" AND WIDER SHEATHING TO EACH BEARING, FACE NAIL.	(3) 8d COMMON, (3) 3" x 0.128" NAILS
JOIST TO SILL OR GIRDER, TOENAIL	(3) 8d COMMON , (3) 3" x 0.131" NAILS, OR (3) 3" 14 GAGE STAPLES
RIM JOIST, BLOCKING TO TOP PLATE, TOENAIL.	8d (2 1/2" x 0.131") AT 6" o/c, 3" x 0.131" NAILS AT 6" o/c, OR 3" 14 GAGE STAPLES AT 6" o/c
1" x 6" SUBFLOOR OR LESS TO EACH JOIST, FACE NAIL	(2) 8d COMMON
2" SUBFLOOR TO JOIST OR GIRDER, BLIND AND FACE NAIL	(2) 16d COMMON
2" PLANKS.	(2) 16d COMMON AT EACH BEARING
BUILT-UP GIRDER AND BEAMS	20d COMMON AT 32" o/c, 3" x 0.131" NAILS AT 24" o/c, OR 3" 14 GAGE STAPLES AT 24" o/c AT, AT TOP AND BOTTOM, STAGGERED (2) 20d COMMON, (3) 3" x 0.131" NAILS, OR (3) 3" 14 GAGE STAPLES AT ENDS AND AT EACH SPLICE
LEDGER STRIP, EACH JOIST OR RAFTER, FACE NAIL	(3) 16d COMMON, (4) 3" x 0.131" NAILS, OR (4) 3" 14 GAGE STAPLES
JOIST TO BAND JOIST, FACE NAIL	(3) 16d COMMON, (4) 3" x 0.131" NAILS, OR (4) 3" 14 GAGE STAPLES
BRIDGING TO JOIST, TOENAIL EACH END	(2) 8d COMMON , (2) 3" x 0.131" NAILS, OR (2) 3" 14 GAGE STAPLES
BRIDGING TO JOIST, TOENAIL EACH END	(2) 8d COMMON , (2) 3" x 0.131" NAILS, OR (2) 3" 14 GAGE STAPLES

WOOD HARDWARE NAILING SCHEDULE				
HOLDOWNS				
SIMPSON				USP
MODEL NAME	CAPACITY (LBS)	FASTENER SCHEDULE	APPLICATION	MODEL NAME
STHD14	3,500	(24) 10d Nails (0.148" x 3-¼")	HOLDOWN	
HTT4	4,455	(18) SD #10 1-½"	HOLDOWN	
HDU4	4,565	(10) ¼" x 2-½" SDS	HOLDOWN	
HDU5	5,645	(14) ¼" x 2-½" SDS	HOLDOWN	
HDU8	6,765	(20) ¼" x 2-½" SDS	HOLDOWN	
HDU11	9,335	(30) ¼" x 2-½" SDS	HOLDOWN	
HDU14	10,770	(36) ¼" x 2-½" SDS	HOLDOWN	
ANCHOR BOLTS				
SSTB20	4,785	⅝"	HOLDOWN ANCHOR	
SSTB24	5,790	⅝"	HOLDOWN ANCHOR	
SSTB28	11,645	⅞"	HOLDOWN ANCHOR	
SB1x30	13,090	1"	HOLDOWN ANCHOR	
HARDWARE				
A34	465	(8) 8d Nails (0.131" x 1-½")	AT BLOCKING OR RIM	MPA1
A35	650	(12) 8d Nails (0.131" x 1-½")	AT BLOCKING OR RIM	MPA1
LTP4	625	(12) 8d Nails (0.131" x 1-½")	AT BLOCKING OR RIM	MP4F
LTP5	565	(12) 8d Nails (0.131" x 1-½")	AT BLOCKING OR RIM	MP4F
LS50	560	(8) 8d Nails (0.131" x 1-½")	AT BLOCKING OR RIM	MP5
STRAPS				
MODEL NAME	CAPACITY (LBS)	FASTENER SCHEDULE	APPLICATION	MODEL NAME
CS16	1,705	(22) 8d Nails (0.131" x 2-½")	DIRECTLY TO TIMBER	RS150
CS16	1,705	(22) 8d Nails (0.131" x 2-½")	THRU PLYWOOD	RS150
CS14	2,490	(30) 8d Nails (0.131" x 2-½")	DIRECTLY TO TIMBER	
CMSTC16	4,690	(50) 10d Nails (0.148" x 3-¼")	DIRECTLY TO TIMBER	
CMST14	6,475	(66) 10d Nails (0.148" x 2-½")	DIRECTLY TO TIMBER	
CMST12	9,215	(86) 10d Nails (0.148" x 2-½")	DIRECTLY TO TIMBER	
SHEAR WALLS				
NAIL TYPE	SHEAR WALL TYPE	NAIL SIZE		
8d COMMON	SW 2, 3, 4, 6	2-1/2" x .131"		
10d COMMON	SW 2B	3" x .148"		

WOOD MANUFACTURED PLATED TRUSSES

1. MANUFACTURED PLATED TRUSSES ARE A DEFERRED SUBMITTAL ITEM. SEE DESIGN/BUILD NOT SECTION FOR REQUIREMENTS.
2. GRAVITY LOADS: REFER TO PROJECT DESIGN CRITERIA FOR ALL ROOF & FLOOR MEMBER GRAVITY LOAD REQUIREMENTS. TRUSSES SHALL BE DESIGNED WITH CONSIDERATION FOR ALL SUPERIMPOSED LOADING, SUCH AS CHIMNEY FLUE FRAMING, MECHANICAL EQUIPMENT, ETC.
3. LATERAL LOADS: TRUSSES SHALL BE DESIGNED FOR SPECIFIC DRAG LOADS NOTED ON THE STRUCTURAL PLANS. ALL GABLE END TRUSSES SHALL BE DESIGNED FOR A MINIMUM 1000# LATERAL LOAD.
4. MATERIAL: ALL TRUSSES SHALL UTILIZE DOUGLAS FIR LUMBER UNLESS NOTED OTHERWISE.
5. DESIGN & CONSTRUCTION: THE STRUCTURAL DESIGN, MEANS OF CONSTRUCTION AND BRACING OF TRUSSES IS THE SOLE RESPONSIBILITY OF THE TRUSS MANUFACTURER AND ENGINEER OF RECORD FOR THE TRUSS DESIGN AND NOT ISE.
6. SHOP DRAWINGS: THE TRUSS SUPPLIER SHALL SUBMIT SHOP DRAWINGS TO ISE FOR REVIEW AND APPROVAL FOR GENERAL CONFORMANCE TO THE BUILDING STRUCTURAL DESIGN. THE SHOP DRAWINGS SHOULD INCLUDE A FLOOR PLAN LAYOUT AND DESIGN FOR EACH SPECIFIC TRUSS. THE TRUSS CALCULATION SHOULD INCLUDE MATERIAL TYPE, LOADING, TRUSS PROFILE AND REACTIONS.
7. HANGERS: THE TRUSS SUPPLIER SHALL SPECIFY ALL TRUSS TO TRUSS & TRUSS TO FRAMING MEMBER HANGERS.
8. LAYOUT & SPACING: THE STRUCTURAL PLANS SPECIFY A RECOMMENDED SPACING OF TRUSSES. THE TRUSS DESIGN PACKAGE DETERMINES THE FINAL SPACING OF TRUSSES. THE INTENT OF THE STRUCTURAL PLANS IS A RECOMMENDATION AND IN NO WAY REPRESENTS THE FINAL TRUSS SHAPE, CONFIGURATION OR SPACING.
9. TRUSS DEFLECTION SHALL BE LIMITED TO THE FOLLOWING:

DEFLECTION CRITERIA		
LEVEL	LIVE LOAD	TOTAL LOAD
ROOF	L/360	L/240
FLOOR	L/600	L/240

MANUFACTURED LUMBER PRODUCTS

1. MANUFACTURED LUMBER: ALL MANUFACTURED SHALL HAVE ICC APPROVAL FOR THE LATEST BUILDING CODE.
2. SIZES & STRENGTH: THE FOLLOWING MINIMUM DESIGN VALUES MUST BE ACHIEVED FOR EACH TYPE OF MANUFACTURED LUMBER SPECIFIED ON THE STRUCTURAL PLANS.

STRUCTURAL COMPOSITE LUMBER			
BEAM TYPE	MINIMUM DESIGN VALUES		
	Fb (PSI)	Fv (PSI)	E (PSI x 10^6)
PSL - PARALLAM	2,900	290	2.2
LVL - MICROLAM	2,600	285	1.9
LSL - TIMBERSTRAND	2,325	310	1.55
RIM - TIMBERSTRAND	1,700	400	1.3

3. FOR UNPROTECTED EXTERIOR APPLICATIONS, CONTRACTOR TO PROVIDE EXTERIOR GRADE PRODUCTS OF EQUIVALENT DESIGN CAPACITY PER MANUFACTURER REQUIREMENTS. CONTRACTOR TO IMMEDIATELY NOTIFY THE STRUCTURAL EOR OF ANY DISCREPANCIES, PRIOR TO THE START OF CONSTRUCTION.

NAILS

1. DIAPHRAGM NAILING: ALL FLOOR SHEATHING, ROOF SHEATHING AND SHEAR PANELS CONSTRUCTED USING WOOD-BASED STRUCTURAL-USE PANELS SHALL BE FASTENED WITH COMMON NAILS. HARDWARE SHALL BE NAILED PER MANUFACTURER'S REQUIREMENTS, OTHERWISE SHORT NAILS MAY BE USED. NAILING SHALL BE PER THE BUILDING CODE UNLESS NOTED OTHERWISE ON THE PLANS OR DETAILS.
2. NAIL GUNS: MUST BE EQUIPPED WITH A FLUSH NAILER ATTACHMENT FOR NAILING OF PLYWOOD SHEAR WALLS, FLOOR SHEATHING AND ROOF SHEATHING.
3. NAIL MANUFACTURING: ALL NAILS MUST BE DOMESTICALLY MANUFACTURED & MEET THE REQUIREMENTS OF THE CURRENT BUILDING CODE.
4. GALVANIZED NAILS: ALL NAILS INTO PRESSURE TREATED LUMBER SHALL BE HOT DIPPED GALVANIZED OR OTHER APPROVED COATING TO RESIST CORROSION UNLESS PRESSURE TREATED PLATE IS TREATED WITH BORATE.

WOOD FRAMING

1. SAWN LUMBER: ALL STRUCTURAL SAWN LUMBER SHALL BE DOUGLAS FIR LARCH WITH 19% MAXIMUM MOISTURE CONTENT OF THE FOLLOWING GRADES, CONFORMING TO STANDARD GRADING RULES FOR WEST COAST LUMBER NO. 17, UNLESS NOTED OTHERWISE. THE LUMBER GRADES AS SPECIFIED BELOW MEET MINIMUM REQUIREMENTS:

LUMBER GRADES	
CONDITION	GRADE
PLATES & BLOCKING	STANDARD OR BETTER
STUDS TO 10'-0" IN HEIGHT	STANDARD OR BETTER
STUDS OVER 10'-0" IN HEIGHT	#2
2x RAFTER JOISTS	#2
4x6 THROUGH 4x12 BEAMS, HEADER & POSTS	#2
4x14 BEAMS, HEADERS & POSTS	#1
4x4 POSTS, HEADERS	#2
6x AND LARGER POSTS, BEAMS, STRINGERS	#1

2. GRADE STAMPS: WHERE POSSIBLE ALL LUMBER GRADE STAMPS SHALL REMAIN ON LUMBER AFTER INSTALLATION. CONVENTIONAL LUMBER SHALL MEET DOC PS 20 REQ.
3. PRESSURE TREATED LUMBER: ALL EXPOSED EXTERIOR WOOD AND WOOD BEARING ON CONCRETE OR MASONRY SHALL BE PRESSURE TREATED FIR. ALL NAILS TO PLATES TREATED w/ BORATE MAY BE STANDARD NAILS, FOR ALL OTHER PRESSURE TREATED PLATES, USE HOT DIP GALVANIZED NAILS.
4. PLYWOOD/OSB: EACH WOOD-BASED STRUCTURAL-USE PANEL USED FOR DIAPHRAGM CONSTRUCTION SHALL BE IDENTIFIED BY A REGISTERED STAMP OR BRAND OF AN ICC-APPROVED COMPLIANCE ASSURANCE AGENCY.WOOD-BASED STRUCTURAL-USE PANELS SHALL MEET THE REQUIREMENTS OF DOC PS 1 OR PS 2. ALL PANELS SHALL BE GLUED WITH EXTERIOR TYPE GLUE MEETING APA SPECIFICATIONS. PANELS PERMANENTLY EXPOSED TO THE OUTDOORS SHALL BE EXTERIOR TYPE.
5. METAL CONNECTORS: ALL METAL CONNECTORS SHALL BE THOSE MANUFACTURED BY SIMPSON STRONG TIE OR USP LUMBER CONNECTORS. THE NAILS FOR THESE CONNECTORS SHALL BE AS SPECIFIED BY THE MANUFACTURERS FOR CAPACITY OF THE HARDWARE. ALL CALLOUTS REFER TO SIMPSON PRODUCT CODES AND NAMES. REFER TO CROSS REFERENCE TABLES PROVIDED BY USP IN THEIR PRODUCT CATALOGS.
6. FIRE STOPS: PROVIDE FIRE STOPS AT ALL INTERSECTIONS OF STUD WALLS AT FLOOR, CEILING AND ROOF. FIRE STOPS SHALL BE 2x NOMINAL THICKNESS OF WOOD AND SHALL BE THE FULL WIDTH OF THE ENCLOSED SPACE. PLACE FIRESTOPS AT A MAXIMUM SPACING OF 10'-0" IN THE VERTICAL DIRECTION. PROVIDE 2x FIRE STOPS IN ALL FURRED SPACES, VERTICAL AND HORIZONTAL, AND AT A MAXIMUM SPACING OF 10'-0" IN EACH DIRECTION AND AT THE SAME LINES AS FIRE STOPS IN ADJACENT STUD WALLS.
7. BOLT HOLES: IN WOOD SHALL BE 1/32" TO 1/16" LARGER THAN THE NOMINAL BOLT DIAMETER . ALL BOLTS SHALL HAVE A STANDARD CUT WASHER UNDER HEAD AND NUT UNLESS NOTED OTHERWISE.
8. BOLTS: ALL BOLTS USED FOR WOOD CONNECTIONS SHALL BE ASTM A307, U.N.O. ALL NUTS AND BOLTS SHALL BE RE-TIGHTENED PRIOR TO THE APPLICATION OF SHEATHING, PLASTER, ETC.
9. NOTCHING & CUTTING: STRUCTURAL MEMBERS SHALL NOT BE CUT FOR PIPES, ETC. UNLESS SPECIFICALLY DETAILED. NOTCHING OF HORIZONTAL STRUCTURAL MEMBERS SHALL CONFORM TO THE BUILDING CODE. NOTCHING AND BORING OF STUDS AND TOP PLATES SHALL CONFORM TO THE BUILDING CODE.
10. JOIST BLOCKING: PROVIDE 2x BLOCKING BETWEEN JOISTS AND RAFTERS AT ALL BEARING SUPPORTS U.N.O. CROSS BRIDGING OR SOLID BLOCKING SHALL BE PROVIDED AT 8'-0" O.C. MAXIMUM FOR ALL JOISTS UNLESS BOTH EDGES ARE HELD IN LINE FOR THEIR ENTIRE LENGTH.
11. JOIST HANGERS: FOR I-JOISTS, PROVIDE SIMPSON "IUS" HANGER. FOR CONVENTIONAL JOIST, USE SIMPSON "LUS" HANGER, OR EQUIVALENT.
12. BEAM BEARING: ALL BEAMS TO BE SUPPORTED WITH FULL BEARING UNLESS NOTED OTHERWISE.
13. CONVENTIONAL FRAMING: ALL CONVENTIONAL FRAMED PORTIONS OF THE STRUCTURE ARE TO BE CONSTRUCTED PER CBC SECTION 2308 .
14. WALLS ON WOOD FLOOR: PROVIDE SINGLE FLOOR JOIST BELOW NON-BEARING, PARALLEL WALLS 10'-0" OR LONGER.
15. FINGER JOINTED STUDS: IT IS STRUCTURALLY ACCEPTABLE TO USE STRUCTURAL GLUED (FINGER-JOINTED) LUMBER. ALL FINGER-JOINTED LUMBER MUST BE "CER EXT JNTS" AND CONFORM WITH THE WWPA'S GLUED PRODUCTS PROCEDURES AND QUALITY CONTROL. FINGER-JOINTED LUMBER IS TO BE STAMPED WITH "CER EXT JNTS" AND MAY BE USED INTERCHANGEABLE WITH ANY SOLID-SAWN LUMBER PRODUCT OF THE SAME SPECIES AND GRADES. PLEASE REFER TO LUMBER SPECIFICATION IN THE STRUCTURAL GENERAL NOTES AND CALCULATIONS.
16. PLATE WASHERS AT NON-SILL PLATE APPLICATION: MINIMUM SIZE FOR SQUARE PLATE WASHERS: (REFER TO PLANS FOR SILL PLATE WASHER REQUIREMENTS.)

PLATE WASHERS NON SILL PLATE APPLICATION	
BOLT SIZE	PLATE WASHER SIZE
½"	3/16" x 2" x 2"
⅝"	1/4" x 2 1/2" x 2 1/2"
¾"	5/16" x 2 3/4" x 2 3/4"
⅞"	5/16" x 3" x 3"
1"	3/8" x 3 1/2" x 3 1/2"

PROPRIETARY ANCHORAGES AND FASTENERS

1. ANCHORAGES:
   - 1.1. DRILL AND EPOXY ANCHORS: SIMPSON SET-XP EPOXY ADHESIVE SYSTEM USING THREADED STEEL RODS CONFORMING TO ASTM-F1554, GRADE 36, OR REINFORCING STEEL CONFORMING TO ASTM A615 OR A706, GRADE 60, COMPLYING WITH ICC-ES ESR-2508. INSTALLERS TO BE CERTIFIED BY MANUFACTURER.
   - 1.2. SIMPSON 'SET-3G' EPOXY ADHESIVE SYSTEM USING THREADED STEEL RODS CONFORMING TO ASTM-F1554, GRADE 36, OR REINFORCING STEEL CONFORMING TO ASTM A615 OR A706, GRADE 60. EPOXY SHALL COMPLY WITH ICC-ES ESR-4057. INSTALLERS TO BE CERTIFIED BY MANUFACTURER.
   - 1.3. MECHANICAL ANCHORS:
     - 1.3.1. HILTI KWIK BOLT-III CARBON STEEL EXPANSION ANCHORS COMPLYING WITH ICC-ES ESR-1385.
     - 1.3.2. HILTI KWIK BOLT-TC CARBON STEEL EXPANSION ANCHORS COMPLYING WITH ICC-ES ESR-1917
     - 1.3.3. SIMPSON TITEN HD ANCHORS STEEL SCREW ANCHORS COMPLYING WITH ICC-ES ESR-2713.
       NOTE: TITEN HD ANCHORS SHALL BE STAINLESS STEEL IN EXPOSED AND/OR WET ENVIRONMENTS, COMPLYING WITH IAPMO-UES ER-493.
   - 1.4. WELDED SHEAR STUDS: NELSON 3SL FLUX FILLED HEADED STUD ANCHORS, 60,000 PSI MINIMUM ULTIMATE TENSILE STRENGTH, AUTOMATICALLY END WELDED IN FIELD CONFIRMING TO ASTM A108 AND COMPLYING WITH ICC-ES ESR-2856.
   - 1.5. WELDED DEFORMED ANCHORS: NELSON D2L COLD ROLLED, DEFORMED STEEL REINFORCING BARS CONFORMING TO ASTM A496 AND COMPLYING WITH ICC-ES ESR-2907.
2. FASTENERS:
   - 2.1. POWDER ACTUATED FASTENERS: HILTI XCP, COMPLYING WITH CURRENT ICC-ES ESR-2379. PROVIDE APPROPRIATE WASHER BETWEEN FASTENER HEAD AND LIGHT GAUGE METAL OR WOOD SURFACE.
     - 2.1.1. POWER-DRIVEN FASTENERS SHALL NOT BE USED TO ANCHOR SILL PLATES EXCEPT AT INTERIOR NON-BEARING WALL NOT DESIGN AS SHEAR WALLS.
   - 2.2. SELF-DRILLING METAL SCREWS (INDICATED "SCREWS" ON DRAWINGS): MINIMUM 0.292-INCH HEAD DIAMETER SELF-DRILLING/SELF-TAPPING STEEL SCREWS COMPLYING WITH ICC ES REPORT. MINIMUM YIELD STRESS, FY=33 KSI.
   - 2.3. FASTENERS, INCLUDING NUTS AND WASHERS, IN CONTACT WITH PRESERVATIVE-TREATED WOOD SHALL BE HOT DIPPED ZINC-COATED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER. STAPLES SHALL BE OF STAINLESS STEEL. FASTENERS OTHER THAN NAILS, STABLES, TIMBER RIVETS, WOOD SCREWS AND LAG SCREWS SHALL BE PERMITTED TO BE OF MECHANICALLY DEPOSITED ZINC-COATED STEEL WITH COATING WEIGHTS IN ACCORDANCE WITH ASTM B695, CLASS 55 MINIMUM.
     - 2.3.1. EXCEPTION: PLAIN CARBON STEEL FASTENERS, INCLUDING NUTS AND WASHERS, IN SBX/DOT AND ZINC BORATED PRESERVATIVE WOOD IN AN INTERIOR, DRY ENVIRONMENT SHALL BE PERMITTED.
3. INSTALLATION: SEE MANUFACTURER'S WRITTEN INSTRUCTIONS AND REFERENCED ICC-ES OR IAPMO-UES REPORT.
4. TESTING FOR DRILL AND EPOXY ANCHORS:
   - 4.1. SPECIAL INSPECTION: SPECIAL INSPECTOR (3RD PARTY) SHALL PERFORM SPECIAL INSPECTION OF DRILL/EPOXY ANCHORS PER SCHEDULE ON SHEET SN3.
5. MATERIALS NOT TO BE PENETRATED BY FASTENERS OR ANCHORAGES: POST-TENSIONED CONCRETE AND PRECAST, PRESTRESSED CONCRETE UNLESS SPECIFICALLY DETAILED HEREIN OR AS ACCEPTED IN WRITING BY ARCHITECT (STRUCTURAL ENGINEER). WHEN INSTALLATION IS PERMITTED, LOCATE PRESTRESSING AND POST-TENSIONED TENDONS WITH NON-DESTRUCTIVE TESTING PRIOR TO INSTALLATION.
6. DRILLING HOLES IN EXISTING CONCRETE OR MASONRY FOR ANCHORAGES: USE NON-PNEUMATIC, ROTARY HAMMER TOOLS WITH ANSI COMPLIANT NON-REBAR CUTTING DRILL BITS TO DRILL HOLES OF PROPER TOLERANCES. LOCATE EXISTING REBAR INCLUDING PRESTRESSING AND POST-TENSIONING TENDONS USING NON-HAZARDOUS, NONDESTRUCTIVE METHODS WITH ACCURATE LOCATION TOLERANCES (PLUS OR MINUS ¼" INCH PRIOR TO DRILLING HOLES TO AVOID CUTTING OR DAMAGING. HOLES SHALL BE THOROUGHLY CLEANED PER MANUFACTURERS WRITTEN RECOMMENDATIONS PRIOR TO INSTALLATION OF ANCHORAGES.
7. DELETERIOUS MATERIALS: KEEP ANCHORAGES - INCLUDING HOLES FOR DRILL AND EPOXY ANCHORS AND MECHANICAL ANCHORS - FREE OF DUST, GREASE, AND OTHER MATERIALS THAT IMPAIR BOND.
8. EXTERIOR PROPRIETARY ANCHORS & FASTENERS: FOR EXTERIOR APPLICATIONS & CORROSIVE ENVIRONMENTS, ALL ANCHORS SHALL BE GALVANIZED OR STAINLESS STEEL. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT (STRUCTURAL ENGINEER) OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION
9. EXTERIOR ANCHOR BOLTS AND/OR POST BASES SHALL BE GALVANIZED AND SHALL HAVE AT LEAST TWO GALVANIZED NUTS ABOVE THE BASE PLATE.

REINFORCING STEEL

1. REINFORCING STEEL:
   - A. ALL BARS, U.N.O.: ASTM A615, GRADE 60
   - B. BARS TO BE WELDED: ASTM A706, GRADE 60
   - C. ADDITIONAL REQUIREMENTS FOR BARS, EXCLUDING TIES, IN DUCTILE MOMENT RESISTING FRAMES AND BOUNDARY ELEMENTS IN SHEAR WALLS: NO ADDITIONAL REQUIREMENTS IF ASTM A706, GRADE 60 BARS USED. ASTM A615, GRADE 60 BARS ARE PERMITTED PROVIDED ACTUAL YIELD STRENGTH BASED ON MILL TESTS DOES NOT EXCEED SPECIFIED YIELD STRENGTH BY MORE THAN 18,000 PSI (RETESTS SHALL NOT EXCEED THIS VALUE BY MORE THAN AN ADDITIONAL 3,000 PSI) AND RATIO OF ACTUAL ULTIMATE TENSILE STRESS TO ACTUAL TENSILE YIELD STRENGTH IS NOT LESS THAN 1.25.
2. WIRE AND SPIRAL REINFORCING:
   - A. SMOOTH WELDED WIRE FABRIC (W.W.F.): ASTM A185, FY=65 KSI, FLAT SHEETS ONLY. DO NOT USE ROLLED MESH. LAP SPACES (1 FOOT MINIMUM). OFFSET LAPS IN ADJACENT SHEETS TO AVOID CONTINUOUS LAPS.
   - B. DEFORMED WIRE STIRRUPS (D4 AND LARGER ONLY): ASTM A497, FY=65 KSI.
   - C. SPIRAL REINFORCING: ASTM A82, GRADE 60
3. SHOP DRAWINGS: ACI 315, PART B. SHOW REINFORCING STEEL PLACEMENT INCLUDING SIZES, QUANTITIES, SPACING, CLEARANCES, SPLICE LOCATIONS, LAP LENGTHS, AND CONCRETE COVERAGE AND SUBMIT TO ARCHITECT (STRUCTURAL ENGINEER). PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER) PRIOR TO DEVELOPING SHOP DRAWINGS IF INSUFFICIENT CLEAR DISTANCES BETWEEN REINFORCING STEEL AND OTHER CONGESTION IS SHOWN. NOTIFY SPECIAL INSPECTOR (3RD PARTY) OF ADJUSTMENTS MADE FROM APPROVED CONTRACT DOCUMENTS WHICH ARE INDICATED ON ACCEPTED SHOP DRAWINGS THAT FACILITATE FIELD PLACEMENT OF REINFORCING STEEL AND CONCRETE.
4. SPLICE LOCATIONS: SPLICE #5 BARS AND LARGER ONLY AT LOCATIONS INDICATED. IF ADDITIONAL SPLICE LOCATIONS ARE PROPOSED, PROMPTLY NOTIFY ARCHITECT (STRUCTURAL ENGINEER) PRIOR TO DEVELOPING SHOP DRAWINGS.
   - A. SPLICES IN WALLS: LOCATE SPLICES IN HORIZONTAL BARS AT WELL-STAGGERED LOCATIONS. DO NOT SPLICE VERTICAL BARS EXCEPT AT HORIZONTAL SUPPORTS SUCH AS FLOOR AND ROOF DIAPHRAGMS.
5. MINIMUM CLEARANCES BETWEEN PARALLEL REINFORCING STEEL INCLUDING DISTANCE BETWEEN SETS OF SPLICED BARS: 1" OR 1 db, WHICHEVER IS GREATER. 1 1/2" OR 1 1/2 db WHICHEVER IS GREATER, AT COLUMNS, PIERS, AND PILASTERS ONLY. FOR BUNDLED BARS, MINIMUM CLEAR DISTANCES BETWEEN UNITS OF BUNDLED BARS SHALL BE SAME AS SINGLE BARS EXCEPT BAR DIAMETER IS DERIVED FROM EQUIVALENT TOTAL AREA OF BUNDLE.
7. DOWELS AT CONSTRUCTION JOINTS: PROVIDE DOWELS MATCHING SIZE AND QUANTITY OF REINFORCING STEEL INTERRUPTED AT CONSTRUCTION JOINTS, UNLESS DETAILED OTHERWISE.
8. PLACEMENT OF BARS IN WALLS: PLACE VERTICAL BARS CLOSEST TO WALL SURFACES AT CURTAINS CONTAINING VERTICAL AND HORIZONTAL BARS OF THE SAME SIZE. IN CURTAINS WHICH VERTICAL AND HORIZONTAL BARS ARE OF DIFFERENT SIZES OR SPACING, PLACE LAYER WITH MOST STEEL AREA CLOSEST TO NEAR WALL SURFACE.
9. BARS TERMINATING AT WALLS, COLUMNS, BEAMS, AND FOUNDATIONS: EXTEND BARS TO WITHIN 2" (3" AT CONCRETE POURED AGAINST EARTH) OF FAR FACE OF WALL, COLUMN, BEAM OR FOUNDATION AND PROVIDE STANDARD ACI 90-DEGREE HOOK UNLESS DETAILED OTHERWISE.
10. BARS INTERRUPTED BY STRUCTURAL STEEL: EXTEND BARS TO WITHIN 2" OF STEEL FACE AND PROVIDE STANDARD ACI 90-DEGREE HOOK UNLESS DETAILED OTHERWISE.
11. WELDING: AWS D1.4, EXCEPT AS MODIFIED BY APPLICABLE CODE STANDARD 19-1. SEE RGA #3-77 OF REDWOOD CITY "R" BOOK FOR ADDITIONAL REQUIREMENTS IF GOVERNING CODE AUTHORITY IS REDWOOD CITY DEPARTMENT OF BUILDING AND SAFETY. PROVIDE WELDER CERTIFICATION PER GOVERNING CODE AUTHORITY.
    - A. ACCEPTABLE REINFORCING STEEL FOR WELDING: IF WELDING OF REINFORCING STEEL OTHER THAN ASTM A706 IS DESIRED, SUBMIT PROPOSED PROCEDURE AND INDICATION OF CONFORMANCE WITH REQUIREMENTS OF GOVERNING CODE AUTHORITY TO ARCHITECT (STRUCTURAL ENGINEER) FOR ACCEPTANCE, AND TO GOVERNING CODE AUTHORITY FOR APPROVAL PRIOR TO EXECUTION OF WELDING.
12. BENDING: BEND COLD UNLESS OTHERWISE ACCEPTED BY ARCHITECT (STRUCTURAL ENGINEER). DO NOT FIELD BEND REINFORCING STEEL BARS EMBEDDED IN CONCRETE UNLESS OTHERWISE ACCEPTED IN WRITING BY ARCHITECT (STRUCTURAL ENGINEER).
13. LAP SPLICES: PROVIDE CLASS B SPLICES UNLESS INDICATED OTHERWISE.

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DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE

CHRISTIAN A. HAINDS
No. C86438
Exp. 03/31/25

DATE: 12/4/2023

SHEET TITLE:

STRUCTURAL NOTES

SHEET NUMBER:

SN2

REQUIRED INSPECTION OF STEEL CONSTRUCTION PER CBC 2019 - SECT. 1705.2 & ACI 360-14

PRIOR TO WELDING STEEL - PER TABLE N5.4-1

CHECK IF REQUIRED	TASK	CONTINUOUS	PERIODIC
X	WELDING QUALIFICATION RECORDS AND CONTINUITY RECORDS		X
X	WELDING PROCEDURES (WPSa) AVAILABLE	X	
X	MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES	X	
X	MATERIAL IDENTIFICATION (TYPE/GRADE)		X
X	WELDER IDENTIFICATION SYSTEM [1]	X	
	FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION) • BACKING TYPE AND FIT (IF APPLICABLE)		X
	FIT-UP OF GROOVE WELDS OF HSS T-, Y- AND K-JOINT WITHOUT BACKING (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)		X
	CONFIGURATION AND FINISH OF ACCESS HOLES		X
X	FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)		X
X	CHECK WELDING EQUIPMENT		X

DURING WELDING STEEL - PER TABLE N5.4-2

CHECK IF REQUIRED	TASK	CONTINUOUS	PERIODIC
X	CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL		X
X	NO WELDING OVER CRACKED TACK WELDS		X
X	ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE		X
X	WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) • PROPER POSITION (F, V, H, OH)		X
X	WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS		X
	PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	X	

AFTER WELDING STEEL - PER TABLE N5.4-3

CHECK IF REQUIRED	TASK	CONTINUOUS	PERIODIC
X	WELDS CLEANED		X
X	SIZE, LENGTH AND LOCATION OF WELDS	X	
X	WELDS MEET VISUAL ACCEPTANCE CRITERIA • CRACK PROHIBITION • WELD/BASE-METAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	X	
X	ARC STRIKES	X	
	K-AREA [2]	X	
	WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES [3]	X	
X	BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	X	
X	REPAIR ACTIVITIES	X	
X	DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	X	
X	NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR		X

FOOTNOTES:

1. THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.
2. WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75 MM) OF THE WELD.
3. AFTER ROLLED HEAVY SHAPES (SEE SECTION A3.1c) AND BUILT-UP HEAVY SHAPES (SEE SECTION A3.1d) ARE WELDED, VISUALLY INSPECT THE WELD ACCESS HOLE FOR CRACKS

EXCEPTION:

SPECIAL INSPECTION OF THE STEEL FABRICATION PROCESS SHALL NOT BE REQUIRED WHERE THE FABRICATOR DOES NOT PERFORM ANY WELDING, THERMAL CUTTING OR HEATING OPERATION OF ANY KIND AS PART OF THE FABRICATION PROCESS. IN SUCH CASES, THE FABRICATOR SHALL BE REQUIRED TO SUBMIT A DETAILED PROCEDURE FOR MATERIAL CONTROL THAT DEMONSTRATES THE FABRICATORS ABILITY TO MAINTAIN SUITABLE RECORDS AND PROCEDURES SUCH THAT, AT ANY TIME DURING THE FABRICATION PROCESS, THE MATERIAL SPECIFICATION, AND GRADE FOR THE MAIN STRESS-CARRYING ELEMENTS ARE CAPABLE OF BEING DETERMINED. MILL TEST REPORTS SHALL BE IDENTIFIABLE TO THE MAIN STRESS-CARRYING ELEMENTS
WHEN REQUIRED BY THE APPROVED CONSTRUCTION DOCUMENTS.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION PER TABLE 1705.3

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
X	INSPECT REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT		X
	REINFORCING BAR WELDING:		
	VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706;		X
	INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM $\frac{5}{16}$"; AND		X
	INSPECT ALL OTHER WELDS	X	
X	INSPECT ANCHORS CAST IN CONCRETE		X
	INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS		
	• ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	X	
	• MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED ABOVE		X
	VERIFY USE OF REQUIRED DESIGN MIX		X
	PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	X	
	INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X	
	VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		X
	INSPECT PRESTRESSED CONCRETE FOR:		
	• APPLICATION OF PRESTRESSING FORCES; AND	X	
	• GROUTING OF BONDED PRESTRESSING TENDONS	X	
	INSPECT ERECTION OF PRECAST CONCRETE MEMBERS		X
	VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS		X
	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED		X

EXCEPTIONS:

1. ISOLATED SPREAD FOOTINGS OF BUILDINGS THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK.

2. CONTINUOUS CONCRETE FOOTINGS SUPPORTING WALLS OF BUILDINGS THREE STORIES OR LESS ABOVE GRADE PLANE THAT ARE FULLY SUPPORTED ON EARTH OR ROCK WHERE:

2.1. THE FOOTINGS SUPPORT WALLS OF LIGHT FRAME CONSTRUCTION;
2.2. THE FOOTINGS ARE DESIGNED IN ACCORDANCE WITH 1809.7; OR
2.3 THE STRUCTURAL DESIGN OF THE FOOTING IS BASED ON f'_c= 2,500 PSI OR LESS, REGARDLESS THE COMPRESSIVE STRENGTH SPECIFIED IN THE IN THE CONSTRUCTION DOCUMENTS OR USED IN THE FOOTING CONSTRUCTION.

3. NON STRUCTURAL CONCRETE SLABS SUPPORTED DIRECTLY ON THE GROUND, INCLUDING PRESTRESSED SLABS ON GRADE, WHERE THE EFFECTIVE PRE-STRESS IS LESS THAN 150 PSI.

4. CONCRETE FOUNDATION WALLS CONSTRUCTED WITH TABLE 1807.1.6.2

5. CONCRETE PATIOS, DRIVEWAYS AND SIDEWALKS ON GRADE.

REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS PER TABLE 1705.6

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
X	VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X
X	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X
X	PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X
X	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	X	
X	PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X

EXCEPTIONS:

WHERE SECTION 1803 DOES NOT REQUIRE REPORTING OF MATERIALS AND PROCEDURES FOR FILL PLACEMENT, THE SPECIAL INSPECTOR SHALL VERIFY THAT THE IN-PLACE DRY DENSITY OF THE COMPACTED FILL IS NOT LESS THAN 90 PERCENT OF THE MAXI-MUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT DETERMINED IN ACCORDANCE WITH ASTM D1557

REQUIRED SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE PER 1705.12

STRUCTURAL STEEL PER 1705.12.1

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	SPECIAL INSPECTIONS OF STRUCTURAL STEEL IN THE SEISMIC FORCE-RESISTING SYSTEMS IN BUILDINGS AND STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY B, C, D, E OR F SHALL BE PER-FORMED IN ACCORDANCE WITH THE QUALITY ASSURANCE REQUIREMENTS OF AISC 341.	--	--

EXCEPTIONS:
1. IN BUILDINGS AND STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY B OR C, SPECIAL INSPECTIONS ARE NOT REQUIRED FOR STRUCTURAL STEEL SEISMIC FORCE-RESISTING SYSTEMS WHERE THE RESPONSE MODIFICATION COEFFICIENT, R, DESIGNATED FOR "STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE, EXCLUDING CANTILEVER COLUMN SYSTEMS" IN ASCE 7, TABLE 12.2-1, HAS BEEN USED FOR DESIGN AND DETAILING.
2. IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E, OR F, SPECIAL INSPECTIONS ARE NOT REQUIRED FOR STRUCTURAL STEEL SEISMIC FORCE-RESISTING SYSTEMS WHERE DESIGN AND DETAILING IN ACCORDANCE WITH AISC 360 IS PERMITTED BY ASCE 7, TABLE 15.4-1.

STRUCTURAL STEEL ELEMENTS PER 1705.12.2

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	INSPECTION OF STRUTS, COLLECTORS, CHORDS AND FOUNDATION ELEMENTS, SHALL BE PERFORMED IN ACCORDANCE WITH THE QUALITY ASSURANCE REQUIREMENTS OF AISC 341.	--	--

EXCEPTIONS:
1. IN BUILDINGS AND STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY B OR C, SPECIAL INSPECTIONS OF STRUCTURAL STEEL ELEMENTS ARE NOT REQUIRED FOR SEISMIC FORCE-RESISTING SYSTEMS WITH A RESPONSE MODIFICATION COEFFICIENT, R, OF 3 OR LESS.
2. IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E, OR F, SPECIAL INSPECTIONS OF STRUCTURAL STEEL ELEMENTS ARE NOT REQUIRED FOR SEISMIC FORCE-RESISTING SYSTEMS WHERE DESIGN AND DETAILING OTHER THAN AISC 341 IS PERMITTED BY ASCE 7, TABLE 15.4-1. SPECIAL INSPECTION SHALL BE IN ACCORDANCE WITH THE APPLICABLE REFERENCED STANDARD LISTED IN ASCE 7, TABLE 15.4-1.

STRUCTURAL WOOD PER 1705.12.2

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	INSPECTION DURING FIELD GLUING OPERATIONS OF ELEMENTS OF THE SEISMIC FORCE-RESISTING SYSTEM.	X	--
X	INSPECTION FOR NAILING, BOLTING, ANCHORING AND OTHER FASTENING OF ELEMENTS OF THE SEISMIC FORCE-RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES, SHEAR PANELS AND HOLD-DOWNS.	--	X

EXCEPTION:
SPECIAL INSPECTIONS ARE NOT REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING AND OTHER FASTENING TO OTHER ELEMENTS OF THE SEISMIC FORCE-RESISTING SYSTEM, WHERE THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER.

COLD-FORMED STEEL LIGHT FRAME CONSTRUCTION PER 1705.11.2

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	INSPECTION FOR WELDING OPERATIONS OF ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM.	--	X
	INSPECTION FOR SCREW ATTACHMENT, BOLTING, ANCHORING AND OTHER FASTENINGS OF ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM, INCLUDING SHEAR WALLS, BRACES, DIAPHRAGMS, COLLECTORS (DRAG STRUTS) AND HOLD-DOWNS.	--	X

EXCEPTION:
SPECIAL INSPECTIONS ARE NOT REQUIRED FOR COLD-FORMED STEEL LIGHT-FRAME SHEAR WALLS AND DIAPHRAGMS, INCLUDING SCREW INSTALLATION, BOLTING, ANCHORING AND OTHER FASTENING TO COMPONENTS OF THE SEISMIC FORCE-RESISTING SYSTEM, WHERE EITHER OF THE FOLLOWING APPLIES:
1. THE SHEATHING IS GYPSUM BOARD OR FIBERBOARD.
2. THE SHEATHING IS WOOD STRUCTURAL PANEL OR STEEL SHEETS ON ONLY ONE SIDE OF THE SHEAR WALL, SHEAR PANEL OR DIAPHRAGM ASSEMBLY AND THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER.

EXCEPTION:
THE SPECIAL INSPECTIONS SPECIFIED IN SECTIONS 1705.12.1 THROUGH 1705.12.9 ARE NOT REQUIRED FOR STRUCTURES
DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH ONE OF THE FOLLOWING:
1. THE STRUCTURE CONSISTS OF LIGHT-FRAME CONSTRUCTION; THE DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS, SDS, AS DETERMINED IN SECTION 1613.2.4, DOES NOT EXCEED 0.5; AND THE BUILDING HEIGHT OF THE STRUCTURE DOES NOT EXCEED 35 FEET.
2. THE SEISMIC FORCE-RESISTING SYSTEM OF THE STRUCTURE CONSISTS OF REINFORCED MASONRY OR REINFORCED CONCRETE; THE DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS, SDS, AS DETERMINED IN SECTION 1613.2.4, DOES NOT EXCEED 0.5; AND THE BUILDING HEIGHT OF THE STRUCTURE DOES NOT EXCEED 25 FEET.
3. THE STRUCTURE IS A DETACHED ONE- OR TWO-FAMILY DWELLING NOT EXCEEDING TWO STORIES ABOVE GRADE PLANE AND DOES NOT HAVE ANY OF THE FOLLOWING HORIZONTAL OR VERTICAL IRREGULARITIES IN ACCORDANCE WITH SECTION 12.3 OF ASCE 7:
3.1. TORSIONAL OR EXTREME TORSIONAL IRREGULARITY.
3.2. NONPARALLEL SYSTEMS IRREGULARITY.
3.3. STIFFNESS-SOFT STORY OR STIFFNESS-EXTREME SOFT STORY IRREGULARITY.
3.4. DISCONTINUITY IN LATERAL STRENGTH-WEAK STORY IRREGULARITY.

REQUIRED SPECIAL INSPECTIONS FOR WIND RESISTANCE PER 1705.11

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	1. IN WIND EXPOSURE CATEGORY B, WHERE V_{ASD} AS DETERMINED IN ACCORDANCE WITH SECTION 1609.3.1 IS 120 MILES PER HOUR OR GREATER	--	X
	2. IN WIND EXPOSURE CATEGORY C OR D, WHERE V_{ASD} AS DETERMINED IN ACCORDANCE WITH SECTION 1609.3.1 IS 110 MPH OR GREATER	--	X

STRUCTURAL WOOD PER 1705.11.1

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	DURING FIELD GLUING OPERATIONS OF ELEMENTS OF THE MAIN WINDFORCE RESISTING SYSTEM	X	--
X	INSPECTION OF NAILING, BOLTING, ANCHORING AND OTHER FASTENING OF ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM, INCLUDING WOOD SHEAR WALLS, WOOD DIAPHRAGMS, DRAG STRUTS, BRACES AND HOLD-DOWNS.	--	X

EXCEPTION:
SPECIAL INSPECTIONS ARE NOT REQUIRED FOR WOOD SHEAR WALLS, SHEAR PANELS AND DIAPHRAGMS, INCLUDING NAILING, BOLTING, ANCHORING AND OTHER FASTENING TO OTHER ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM, WHERE THE SPECIFIED FASTENER SPACING AT PANEL EDGES IS MORE THAN 4 INCHES ON CENTER.

COLD-FORMED STEEL LIGHT FRAME CONSTRUCTION PER 1705.11.2

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	INSPECTION FOR WELDING OPERATIONS OF ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM.	--	X
	INSPECTION FOR SCREW ATTACHMENT, BOLTING, ANCHORING AND OTHER FASTENINGS OF ELEMENTS OF THE MAIN WINDFORCE-RESISTING SYSTEM, INCLUDING SHEAR WALLS, BRACES, DIAPHRAGMS, COLLECTORS (DRAG STRUTS) AND HOLD-DOWNS.	--	X

EXCEPTION:
SPECIAL INSPECTIONS ARE NOT REQUIRED FOR COLD-FORMED STEEL LIGHT-FRAME SHEAR WALLS AND DIAPHRAGMS, INCLUDING SCREWING, BOLTING, ANCHORING AND OTHER FASTENING TO COMPONENTS OF THE WINDFORCE RESISTING SYSTEM, WHERE EITHER OF THE FOLLOWING APPLIES:
1. THE SHEATHING IS GYPSUM BOARD OR FIBERBOARD.
2. THE SHEATHING IS WOOD STRUCTURAL PANEL OR STEEL SHEETS ON ONLY ONE SIDE OF THE SHEARWALL, SHEAR PANEL OR DIAPHRAGM ASSEMBLY AND THE FASTENER SPACING OF THE SHEATHING IS MORE THAN 4 INCHES ON CENTER (O.C.).

WIND RESISTING COMPONENTS PER 1705.11.3

CHECK IF REQUIRED	TYPE	CONTINUOUS	PERIODIC
	ROOF COVERING, ROOF DECK AND ROOF FRAMING CONNECTIONS.	--	X
	EXTERIOR WALL COVERING AND WALL CONNECTIONS TO ROOF AND FLOOR DIAPHRAGMS AND FRAMING.	--	X

QUALITY ASSURANCE (STRUCTURAL OBSERVATION, MATERIALS TESTING, AND SPECIAL INSPECTION)

1. STRUCTURAL OBSERVATION:
   A. COORDINATION RESPONSIBILITIES OF CONTRACTOR: NOTIFY ARCHITECT (STRUCTURAL ENGINEER) 48 HOURS IN ADVANCE OF CRITICAL STAGES OF CONSTRUCTION INDICATED BELOW SO VISITS MAY BE SCHEDULED BY STRUCTURAL OBSERVER. FAILURE BY CONTRACTOR TO MEET OBSERVATION SCHEDULE MAY REQUIRE REMOVAL OF SUBSEQUENT WORK FOR OBSERVATION. CONTRACTOR TO BEAR COSTS OF REMOVAL AND REPLACEMENT OF FINISHED WORK OR FRAMING DAMAGED BY REMOVAL PROCESS OR AS REQUIRED FOR CORRECTIVE ACTION.
   B. PRE-CONSTRUCTION MEETING: OWNER MAY COORDINATE AND CALL FOR MEETING BETWEEN ARCHITECT (STRUCTURAL ENGINEER) RESPONSIBLE FOR STRUCTURAL DESIGN, STRUCTURAL OBSERVER, CONTRACTOR, AFFECTED SUBCONTRACTORS AND SPECIAL INSPECTOR. STRUCTURAL OBSERVER WILL PRESIDE OVER THIS MEETING. PURPOSE OF MEETING IS TO IDENTIFY MAJOR STRUCTURAL ELEMENTS AND CONNECTIONS THAT AFFECT VERTICAL AND LATERAL LOAD RESISTING SYSTEMS OF STRUCTURE AND TO REVIEW SCHEDULE OF STRUCTURAL OBSERVATION, MATERIALS TESTING, AND SPECIAL INSPECTION OF PROJECT.
   C. CRITICAL STAGES OF CONSTRUCTION REQUIRING STRUCTURAL OBSERVATION:
      I. CASTING OF CONCRETE
      II. COVERING OF FRAMING

2. MILL TEST REPORTS CERTIFYING MATERIALS: CONTRACTOR TO SUBMIT MILL TEST REPORTS CERTIFYING REINFORCING STEEL, STRESSING TENDONS, AND STRUCTURAL STEEL ARE OF IDENTIFIABLE TESTED STOCK TO OWNER, SPECIAL INSPECTOR, ARCHITECT (STRUCTURAL ENGINEER) AND, UPON REQUEST, TO GOVERNING CODE AUTHORITY. ENSURE MATERIALS ARE PROPERLY TAGGED FOR IDENTIFICATION. IF MILL TEST REPORTS CANNOT BE MADE AVAILABLE OR IF MATERIAL CANNOT BE IDENTIFIED, TESTING LABORATORY WILL PERFORM TESTS AS DIRECTED BY ARCHITECT (STRUCTURAL ENGINEER). CONTRACTOR SHALL PAY TESTING RELATED TO TESTS AND INSPECTIONS OF UNIDENTIFIABLE MATERIALS FURNISHED WITHOUT MILL LABORATORY FOR COSTS TEST REPORTS. MATERIALS FOUND DEFICIENT AFTER INITIAL TESTS AND INSPECTIONS, OR MATERIALS REPLACING DEFICIENT MATERIALS.
   A. ULTRASONIC EXAMINATION OF HEAVY ROLLED SHAPES AND THICK PLATES AT PROPOSED WELDED MOMENT CONNECTIONS: WHERE COMPLETE PENETRATION GROOVE WELDS OCCUR AT GROUPS 4 AND 5 STRUCTURAL STEEL SHAPES, AS DEFINED IN ASTM A6, AND PLATES EXCEEDING 2 INCHES THICK, SUBMIT MILL TEST REPORTS TO ARCHITECT (STRUCTURAL ENGINEER) AND, UPON REQUEST, TO GOVERNING CODE AUTHORITY. MILL TEST REPORTS SHALL CERTIFY THAT CHARPY V-NOTCH TESTING WAS CONDUCTED IN COMPLIANCE WITH ASTM A6, SUPPLEMENTARY REQUIREMENT S5, INCLUDING IMPACT TEST COMPLYING WITH ASTM A673 AT FREQUENCY H WITH MINIMUM AVERAGE VALUE OF 20 FT.-LBS. ABSORBED ENERGY AT 70 DEGREES FAHRENHEIT.

3. CERTIFICATE OF COMPLIANCE FOR OFFSITE FABRICATION: SUBMIT FOR STRUCTURAL STEEL, GLU-LAMS, AND PLYWOOD-WEB JOISTS, PRECAST CONCRETE IN COMPLIANCE WITH APPLICABLE CODE SECTION 1701.7. SUBMIT TO OWNER, TESTING LABORATORY, ARCHITECT (STRUCTURAL ENGINEER) AND GOVERNING CODE AUTHORITY.

4. WELD TESTING AND INSPECTION: TESTING LABORATORY WILL SUBMIT WELD TEST RESULTS TO OWNER, CONTRACTOR, ARCHITECT (STRUCTURAL ENGINEER) AND, UPON REQUEST, TO GOVERNING CODE AUTHORITY. SEE SPECIFICATIONS FOR TESTING REQUIREMENTS NOT INDICATED ON STRUCTURAL DRAWINGS.

   A. STRUCTURAL STEEL WELDING NOT DESTRUCTIVE TESTING REQUIREMENTS: APART FROM VISUAL INSPECTION AND REVIEW OF FABRICATION AND ERECTION REPORTS OF FABRICATOR/ERECTOR'S OWN QUALITY CONTROL TESTING AND INSPECTION, OWNER'S TESTING LABORATORY WILL PERFORM INDICATED SHOP AND FIELD INSPECTION AND TESTING. TESTING LABORATORY WILL BE AWS CERTIFIED AND WILL PROVIDE INSPECTORS FOR CONTINUOUS INSPECTION OF STEEL FABRICATION AND ERECTION AND STRUCTURAL WELDING. SHOP AND FIELD TESTING OF MATERIALS AND WELDING WILL BE AS FOLLOWS:
      I. COMPLETE JOINT PENETRATION WELDS: FOR STRUCTURES IN RISK CATEGORY III OR IV ULTRASONIC TESTING (UT) SHALL BE PERFORMED BY QA ON ALL CJP GROOVE WELDS SUBJECT TO TRANSVERSELY APPLIED TENSION LOADING IN BUTT, T- AND CORNER JOINTS, IN MATERIALS 5/16 IN. THICK OR GREATER. FOR STRUCTURES IN RISK CATEGORY II, UT SHALL BE PERFORMED BY QA ON 10% OF CJP GROOVE WELDS IN BUTT, T- AND CORNER JOINTS SUBJECT TO TRANSVERSELY APPLIED TENSION LOADING, IN MATERIALS 5/16 IN THICK OR GREATER. FOR STRUCTURES IN RISK CATEGORY I, NDT OF CJP GROOVE WELDS IS NOT REQUIRED. FOR ALL STRUCTURES IN ALL RISK CATEGORIES, NDT OF CJP GROOVE WELDS IN MATERIALS LESS THAN 5/16 IN THICK IS NOT REQUIRED.
      II. ACCESS HOLES: THERMALLY CUT SURFACES OF ACCESS HOLES SHALL BE TESTED BY QA USING MT OR PT, WHEN THE FLANGE THICKNESS EXCEEDS 2 IN. (50 MM) FOR ROLLED SHAPES, OR WHEN THE WEB THICKNESS EXCEEDS 2 IN FOR BUILT-UP SHAPES. ANY CRACK SHALL BE DEEMED UNACCEPTABLE REGARDLESS OF SIZE OR LOCATION.

5. CONTINUOUS SPECIAL INSPECTION: UNLESS OTHERWISE INDICATED, CONTINUOUS SPECIAL INSPECTION WILL BE PERFORMED BY SPECIAL INSPECTOR COMPLYING WITH APPLICABLE CODE SECTION 1701 AND SPECIFICALLY APPROVED BY GOVERNING CODE AUTHORITY FOR EACH INSPECTION CATEGORY BELOW. PERIODIC INSPECTION IS NOT PERMITTED UNLESS INDICATED IN THE PROGRAM OR OTHERWISE ACCEPTED BY ARCHITECT (STRUCTURAL ENGINEER). SEE SPECIFICATIONS FOR ADDITIONAL SPECIAL INSPECTION REQUIREMENTS.

ENGINEER OF RECORD - STRUCTURAL OBSERVATION PROGRAM

STRUCTURAL OBSERVATIONS FOR SEISMIC & WIND RESISTANCE:

1. THE OWNER SHALL EMPLOY THE ENGINEER OR ARCHITECT REGISTERED/LICENSED IN THE STATE OF CALIFORNIA WHO IS RESPONSIBLE FOR THE STRUCTURAL DESIGN TO PERFORM STRUCTURAL OBSERVATION(S).

   ENGINEER IN RESPONSIBLE CHARGE/ENGINEER OF RECORD:

   NAME: SHAWN LOTHROP, SE
   LIC #: S5627

   OBSERVER DESIGNATED BY E.O.R. RESPONSIBLE FOR STRUCTURAL OBSERVATION(S):

   NAME: SHAWN LOTHROP, SE
   LIC #: S5627

2. STRUCTURAL OBSERVATIONS SHALL BE PROVIDED BY THE DESIGNATED STRUCTURAL OBSERVER FOR ALL BUILDINGS AT THE FOLLOWING STAGES OF CONSTRUCTION, UNLESS OTHERWISE AUTHORIZED OR REQUESTED IN WRITING BY THE BUILDING OFFICIAL:

   A. PRE-CONCRETE POUR REBAR OBSERVATION
   B. WOOD FRAMING OBSERVATION PRIOR TO COVERING w/ FINISH & AFTER ROOF LOAD

3. PRIOR TO COMMENCEMENT OF OBSERVATION, THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING DEPARTMENT A WRITTEN STATEMENT IDENTIFYING THE FREQUENCY AND EXTENT OF THE STRUCTURAL OBSERVATION.

4. AT THE CONCLUSION OF WORK, THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING DEPARTMENT A WRITTEN STATEMENT THAT THE STRUCTURAL OBSERVATION VISITS HAVE BEEN MADE AND IDENTIFY ANY REPORTED DEFICIENCIES WHICH, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.

DEPUTY SPECIAL INSPECTOR

1. DEPUTY SPECIAL INSPECTIONS SHALL BE PROVIDED BY:

   NAME: MATRISCOPE ENGINEERING LABORATORIES, INC.
   PHONE NUMBER: 925-606-7700

2. SPECIAL INSPECTOR SHALL BE HIRED BY THE OWNER TO PROVIDE SPECIAL INSPECTIONS AS REQUIRED PER THE PLANS.

3. SPECIAL INSPECTOR: A QUALIFIED PERSON, EMPLOYED BY THE OWNER, WHO HAS DEMONSTRATED COMPETENCE TO THE SATISFACTION OF THE BUILDING OFFICIAL FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION. DUTIES INCLUDE VISUAL INSPECTIONS AND FIELD MEASUREMENTS OF MATERIALS, OBTAINING SPECIMENS FOR TESTS AND RELATED ACTIONS INCLUDING PREPARATION OF REPORTS.

4. CONTINUOUS INSPECTION: ON SITE INSPECTION BY THE SPECIAL INSPECTOR ON A CONTINUOUS BASIS OBSERVING ALL WORK REQUIRING SPECIAL INSPECTION.

5. PERIODIC INSPECTION: INTERMITTENT INSPECTION AS PERMITTED BY THE PLAN, SPECIFIED AT PRE-DETERMINED INTERVALS OR MORE FREQUENTLY AS WORK PROGRESSES. NO SIGNIFICANT ELEMENTS OR AREAS SHALL BE COVERED BY ADDITIONAL WORK UNTIL APPROVED BY THE BUILDING OFFICIAL AND/OR SPECIAL INSPECTOR.

6. REPORTS SHALL BE SUBMITTED TO THE BUILDING OFFICIAL IN A TIMELY MANNER AS DETERMINED BY THE BUILDING OFFICIAL.

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PROJECT DESIGN ENGINEER:
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CONTACT INFORMATION:

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PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE



DATE: 12/4/2023

SHEET TITLE:

STRUCTURAL NOTES

SHEET NUMBER:

SN3

CONT. FOOTING SCHEDULE

FOOTING MARK	CONCRETE FOOTING SIZE WIDTH x EMBD.	STEEL REINFORCING BAR	
		CONTINUOUS LONGITUDINAL BARS	TRANSVERSE BARS
CF12	12" x 18"	(2) #4 T&B	NONE

SPREAD FOOTING SCHEDULE

FOOTING MARK	ISOLATED/SPREAD FOOTING SIZE		STEEL REINFORCING
	WIDTH X LENGTH	EMBEDMENT	
F24	24"x24"	18"	#4 AT 8" O.C. EACH WAY AT BTM, TYP.

STRUCTURAL OBSERVATION REQUIREMENTS

STRUCTURAL OBSERVATION IS REQUIRED BY THE ENGINEER OF RECORD. OUR OFFICE SHOULD BE NOTIFIED TO PERFORM STRUCTURAL OBSERVATION AT THE FOLLOWING STAGES OF CONSTRUCTION:

1. PRIOR TO POUR OF CONCRETE TO OBSERVE REINFORCING & EMBEDS
2. WOOD FRAMING OBSERVATION PRIOR TO ARCHITECTURAL COVERING w/ FINISH & AFTER ROOF LOAD

FOUNDATION LEGEND & SYMBOLS

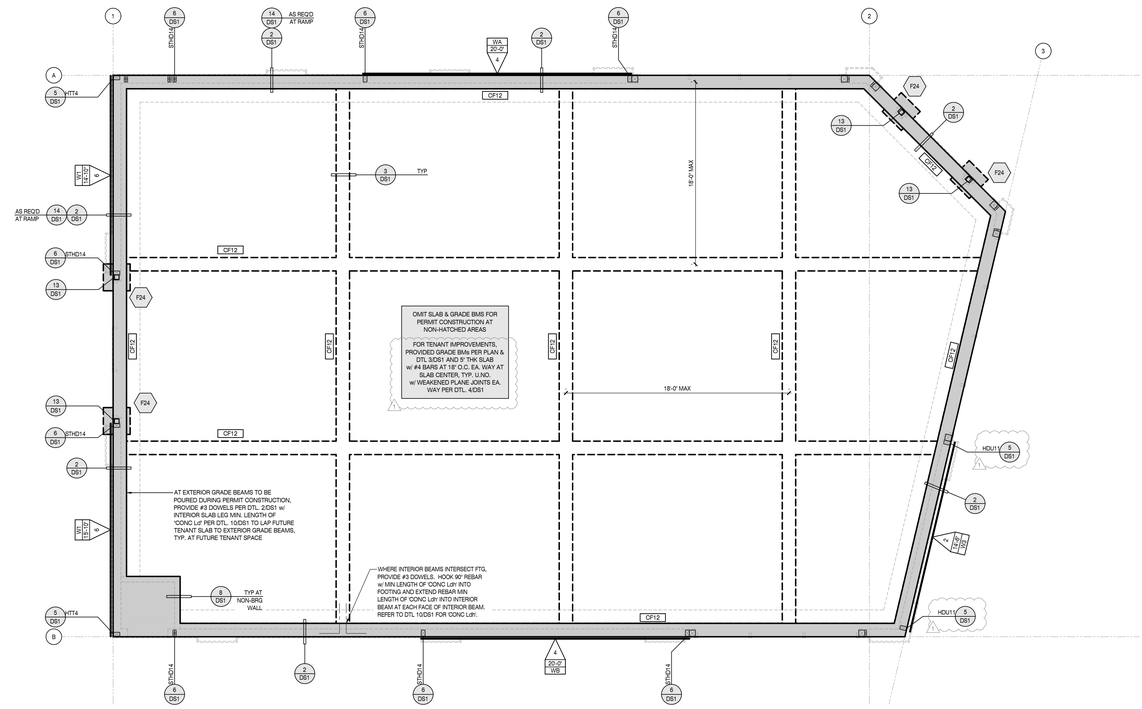
	INDICATES (N) CONCRETE SLAB-ON-GRADE & FOOTING. FOOTING SIZE AND REINFORCING PER SHEET DS1. REFER TO PLAN & SHEET DS1 FOR SLAB THICKNESS & REINFORCEMENT.
ANCHOR /SPACING; AT XX' O.C.; X; XX; DETAIL #; SHEET #	INDICATES DETAIL CUT LOCATION. REFER TO DETAIL # AND STRUCTURAL SHEET NUMBER FOR MORE INFORMATION. TEXT ABOVE BUBBLE INDICATES REVISED HARDWARE OTHER THAN NOTED IN DETAIL
END POST W/ HOLDOWN; TYPE; X; L=X; VIX; WALL CALC ID; LENGTH	INDICATES WOOD SHEAR WALL LOCATION. REFER TO DETAIL 7/DS1 FOR ANCHOR BOLT SIZE & SPACING AT EACH SHEAR WALL TYPE. PROVIDE 3" SQ x 0.229" ANGLE SLOTTED PLATE WASHERS AT EACH ANCHOR BOLT. REDUCE BOLT SPACING BY HALF AT DOUBLE SIDED SHEAR WALLS.
	INDICATES EXTERIOR 2x6 STUD WALL PER DETAIL 5/DS2
F##	INDICATES PAD FOOTING PER DETAIL 13/DS1 w/ REINFORCEMENT PER SPREAD FOOTING SCHEDULE

GEOTECHNICAL INFORMATION

1. REFER TO STRUCTURAL NOTES SHEETS (SN SERIES) FOR ASSUMED SOIL VALUES OR VALUES BASED ON THE PROVIDED GEOTECHNICAL (SOILS) REPORT.
2. PRIOR TO REQUESTING A BUILDING DEPARTMENT FOUNDATION INSPECTION, THE SOILS ENGINEER SHALL CERTIFY IN WRITING THAT:
   a. THE BUILDING PAD WAS PREPARED IN ACCORDANCE WITH THE RECOMMENDATIONS IN THE SOILS REPORT,
   b. THE FOOTINGS EXTEND TO THE PROPER DEPTH OR BEARING STRATA,
   c. UTILITY TRENCHES ARE PROPERLY BACKFILLED AND COMPACTED,
   d. AND THAT THE CONDITIONS FOUND MATCH THOSE ASSUMED IN THE SOILS REPORT.
3. THE OWNER/DEVELOPER AND SUBCONTRACTORS ARE TO REVIEW THE SOILS REPORT PRIOR TO COMMENCING CONSTRUCTION AND VERIFY THE PLANS COMPLY WITH THE CURRENT SOILS REPORT RECOMMENDATIONS. THE STRUCTURAL ENGINEER SHALL BE NOTIFIED IF THE SOILS REPORT DATE SHOWN ON THE STRUCTURAL NOTES SHEET SN1 DOES NOT MATCH THE CURRENT REPORT DATE. THE OWNER/DEVELOPER IS RESPONSIBLE FOR UPDATING THE STRUCTURAL ENGINEER WITH CURRENT GEOTECHNICAL ENGINEERING REQUIREMENTS.

FOUNDATION NOTES

1. INSTALL HOLDOWN ANCHOR BOLTS PER 5&6/DS1. PROVIDE AND INSTALL ALL U.S.P. OR SIMPSON LUMBER CONNECTORS (OR EQUAL) FOUNDATION HARDWARE PER MANUFACTURERS RECOMMENDATIONS. DEEPEN FOOTING WHERE NECESSARY TO PROVIDE ANCHOR EMBEDMENT AT HOLDOWN LOCATIONS.
2. REFER TO SHEAR WALL ANCHOR BOLT SCHEDULE, DETAIL 7/DS1, FOR ANCHOR BOLT SPACING AND FOR ANCHOR BOLT INSTALLATION AT SHEAR WALL CONDITIONS.
3. REFER TO DETAIL PACKAGE FOR TYPICAL CONDITIONS NOT SPECIFICALLY CALLED OUT OR NOTED ON PLANS.
4. ALL DIMENSIONS SHALL BE PER THE CURRENT APPROVED STAMPED SET OF ARCHITECTURAL PLANS, UNLESS NOTED OTHERWISE ON PLAN, ISE SHALL BE NOTIFIED IMMEDIATELY IF DIMENSION DISCREPANCIES EXIST BETWEEN THE ARCHITECTURAL & STRUCTURAL PLANS.
5. CONSTRUCT CONTINUOUS FOOTINGS AT CORNERS AND INTERSECTIONS PER DETAIL 12/DS1.
6. FOUNDATION SIZES, DEPTHS, AND REINFORCEMENT SHOULD BE COORDINATED WITH THE OWNER/DEVELOPER'S SOILS ENGINEERS REPORT. SOILS ENGINEER REPORT MAY REQUIRE ADDITIONAL ITEMS NOT NOTED ON THE STRUCTURAL PLANS.
7. CLIENT/OWNER SHALL ADDRESS CORROSIVE SOIL CONDITIONS. FOR HIGH SULFATE SOIL CONDITIONS, MITIGATE PER ACI TABLE 19.3.2.1. THE CLIENT/OWNER SHALL HAVE A CORROSION ENGINEER PROVIDE MITIGATION RECOMMENDATIONS FOR ALL OTHER CORROSIVE SOIL CONDITIONS. CLIENT IS RESPONSIBLE TO REVIEW STRUCTURAL PLANS AND DETAILS FOR COMPLIANCE TO CORROSION ENGINEERS RECOMMENDATIONS PRIOR TO CONSTRUCTION.



FOUNDATION PLAN

SCALE : 3/16" = 1'-0"

DO NOT SCALE PLANS FOR CONSTRUCTION DIMENSIONS. ALL CONSTRUCTION DIMENSIONS SHOULD BE VERIFIED WITH THE ARCHITECTURAL SET OF PLANS

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PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER; ANNA A. SY; No. C86438; Exp. 03/31/25; CIVIL; STATE OF CALIFORNIA

DATE: 12/4/2023

SHEET TITLE:

FOUNDATION PLAN

SHEET NUMBER:

S1

FRAMING LEGEND & SYMBOLS

END POST W/ HOLDOWN TYPE WALL CALC ID LENGTH	INDICATES: 1. WOOD SHEAR WALL PANEL LOCATION PER PLAN INSTALLED FULL HEIGHT OF WALL 2. REFER TO DETAIL 1/DS2 SHEAR WALL SCHEDULE FOR ADDITIONAL REQUIREMENTS 3. PROVIDE POST AND STRAP/HOLDOWN EACH END OF WALL MIN AS INDICATED PER PLAN 4. AT UPPER FLOORS WHERE WALL SHEATHING DOES NOT EXTEND AND EDGE NAIL TO FLOOR RIM PROVIDE SILL PLATE NAILING OR SCREWS PER DETAIL 1/DS2
INDICATES SHEAR TYPE ABV & BLW OPENING END POST W/ HOLDOWN TYPE LENGTH WALL CALC ID INDICATES HORIZ. STRAP ABV & BLW OPENING	INDICATES: 1. WOOD SHEAR WALL PANEL LOCATION PER PLAN INSTALLED FULL HEIGHT OF WALL AND SHEAR PANEL ABOVE AND BELOW OPENING 2. REFER TO DETAIL 1, DS2 SHEAR WALL SCHEDULE FOR ADDITIONAL REQUIREMENTS 3. PROVIDE POST AND STRAP/HOLDOWN EACH END OF WALL MIN AS INDICATED PER PLAN 4. AT UPPER FLOORS WHERE WALL SHEATHING DOES NOT EXTEND AND EDGE NAIL TO FLOOR RIM PROVIDE SILL PLATE NAILING OR SCREWS PER DETAIL 1/DS2 5. REFER TO DETAIL 5B/DS2 FOR PERFORATED SHEAR WALL CONDITION (SHEAR ABV AND BLW OPENING W/O STRAP) 6. REFER TO DETAIL 5C/DS2 FOR FORCE TRANSFER SHEAR WALL CONDITION (SHEAR ABV AND BLW OPENING W/ STRAP)
TENSION STRAP L=X'-XX"	INDICATES DRAG TIE STRAP TO ROOF/FLOOR BLK'G LENGTH SHOWN INDICATES STRAP LENGTH OFF WALL
	INDICATES DRAG TIE STRAP PER PLAN OR DETAIL SHOWN ON PLANS.

AT XX" O.C. REQUIRED ANCHOR/SPACING DETAIL # SHEET #	INDICATES DETAIL CUT LOCATION. REFER TO DETAIL # AND STRUCTURAL SHEET NUMBER FOR MORE INFORMATION. TEXT ABOVE BUBBLE INDICATES REVISED HARDWARE OTHER THAN NOTED IN DETAIL
	INDICATES 2x STUD WALL PER PLAN & DETAIL 5/DS2. COORDINATE STUD WALL SIZE WITH ARCH. PLANS.
XX	INDICATES: 1. WALL OPENING HEADER PER FRAMING SCHEDULE BELOW 2. PROVIDE (1) 2x TRIMMER EACH SIDE U.N.O. ON PLAN 3. PROVIDE KING STUDS EACH SIDE PER DETAIL 5/DS2 U.N.O. ON PLAN.
XX HU BM TO BM HGR TYP., U.N.O, PER PLAN AS OCCURS. USE CONCEALED FLANGE HGR AS NEEDED	INDICATES: 1. BEAM AS NOTED ON PLANS 2. PROVIDE BEARING STUDS OR POST EACH END TO MATCH WIDTH OF BEAM AND SUPPORT WALL , U.N.O. 3. (1) 2x WALL STUD ALIGNED AT 1 ¾" WIDE LSL BEAMS IS ACCEPTABLE 4. BEAM SHOULD BE INSTALLED WITH BOTTOM OF BEAM ON TOP PLATE (FLUSH CONDITION) U.N.O.
*S	INDICATES: 1. WOOD MANUFACTURED PLATED ROOF TRUSS BY OTHERS AT 48" O.C. 2. ARROWHEADS INDICATE EXTENT OF SPAN AND BEARING LOCATIONS 3. *S = SCISSOR TRUSS W/ SLOPED BOTTOM CHORD PER ARCHITECT AS OCCURS
X AT X' O.C.	INDICATES FRAMING MEMBER SIZE AND SPACING. REFER TO PLANS FOR SPECIFIC MEMBER LAYOUT
	IDENTIFIES BLOCKED HORIZONTAL DIAPHRAGM W/ 2x4 FLAT BLOCKING AT PANEL EDGES & 4" O.C. BOUNDARY NAILING & 6" EDGE NAILING PER DETAIL 2A/SD2
AT-X.X	INDICATES ALIGNED TRUSS W/ LATERAL LOAD 180 PLF (0.7E SEISMIC), U.N.O. & PROVIDE ROOF DIAPHRAGM EDGE NAILING

1

FRAMING NOTES

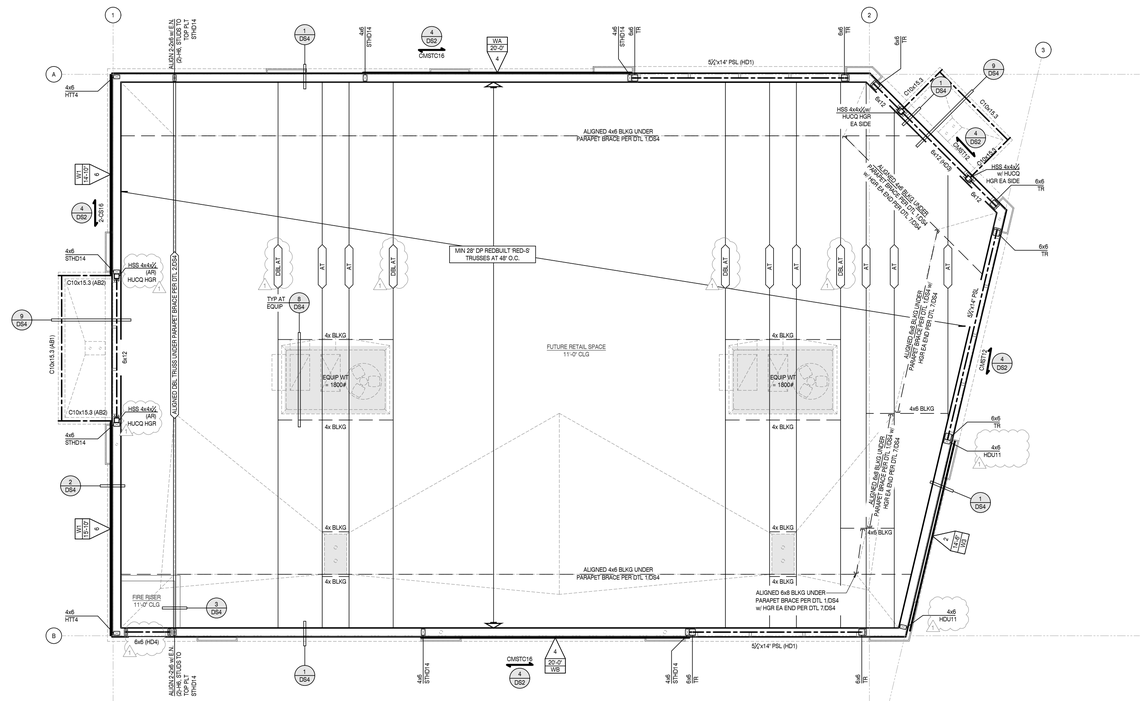
1. REFER TO STRUCTURAL GENERAL NOTE SHEET (SN SERIES) AND DETAILS (DS SERIES) FOR INFORMATION NOT SHOWN ON THE MAIN FRAMING PLANS.
2. PROVIDE SQUASH BLOCKING AT THE FLOOR/ROOF LEVELS ALIGNED BELOW ALL POSTS GREATER THAN 4x4 TO MATCH THE DIMENSIONS OF THE POSTS ABOVE TYPICAL AT DROP BEAMS AND STUD WALLS.
3. WHERE ALIGNED JOIST AND/OR TRUSS INTERFERES w/ FUTURE INSTALLATION OF M.E.P. INSTALLATION, CONTACT STRUCTURAL ENGINEER.
4. SPLICE ALL EXTERIOR WALL AND INTERIOR SHEAR WALL TOP PLATE BREAKS PER DETAIL 4/DS2, TYP.
5. ROOF SHOULD BE FULLY LOADED PRIOR TO NAILING THE TOP PLATE HARDWARE TO ROOF JOIST AND/OR TRUSS BOTTOM CHORD.
6. WATERPROOFING & DRAINAGE SHALL BE PROVIDED BY OTHERS.
7. TRUSSES SHALL ACCOUNT FOR LOADING FROM MECHANICAL EQUIPMENT.

1

STRUCTURAL OBSERVATION REQUIREMENTS

STRUCTURAL OBSERVATION IS REQUIRED BY THE ENGINEER OF RECORD. OUR OFFICE SHOULD BE NOTIFIED TO PERFORM STRUCTURAL OBSERVATION AT THE FOLLOWING STAGES OF CONSTRUCTION:

1. PRIOR TO POUR OF CONCRETE TO OBSERVE REINFORCING & EMBEDS
2. WOOD FRAMING OBSERVATION PRIOR TO ARCHITECTURAL COVERING w/ FINISH & AFTER ROOF LOAD



ROOF FRAMING PLAN

SCALE : 3/16" = 1'-0"

DO NOT SCALE PLANS FOR CONSTRUCTION DIMENSIONS. ALL CONSTRUCTION DIMENSIONS SHOULD BE VERIFIED WITH THE ARCHITECTURAL SET OF PLANS

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PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE



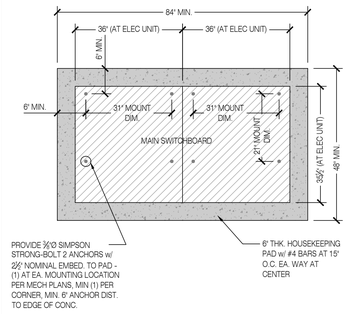
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SHEET TITLE:

ROOF FRAMING PLAN

SHEET NUMBER:

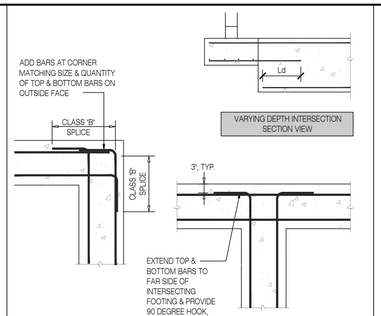
S2



MAIN SWITCHBOARD ATTACHMENT AT SLAB

SCALE: N.T.S.

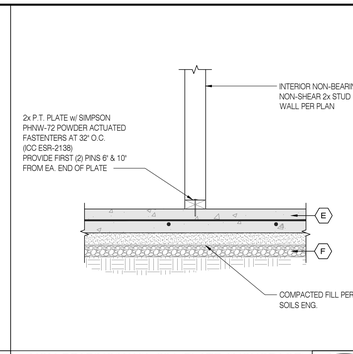
15



REBAR AT FOOTING INTERSECTIONS

SCALE: N.T.S.

12



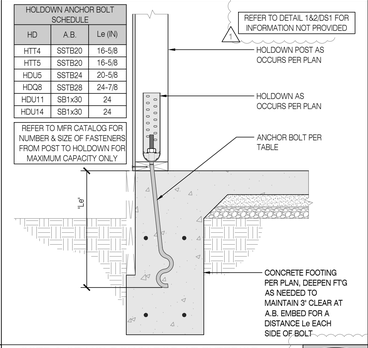
NON-BEARING WALL SILL PLATE ANCHORAGE DETAIL

SCALE: N.T.S.

8

HOLDOWN ANCHOR BOLT SCHEDULE		
HD	A.B.	Le (IN)
HTT4	SSTB20	16-5/8
HTT5	SSTB20	16-5/8
HDU5	SSTB24	20-5/8
HDQ8	SSTB28	24-7/8
HDU11	SB1x30	24
HDU14	SB1x30	24

REFER TO MFR CATALOG FOR NUMBER & SIZE OF FASTENERS FROM POST TO HOLDOWN FOR MAXIMUM CAPACITY ONLY



SSTB & SB HOLDOWN ROD AT EXTERIOR FOOTINGS

SCALE: N.T.S.

5

**SLAB & FOOTING SPECIFICATIONS FOR MEDIUM EXPANSIVE SOILS	
LABEL	*MEDIUM POTENTIAL
	1-STORY
E	SLAB THICKNESS & REINFORCING PER PLAN, TYPICAL
F	10 MIL VAPOR BARRIER OVER 4" COMPACTED CRUSHED ROCK PER GEOTECH ENGINEERS RECOMMENDATIONS

** EXPANSION CATEGORY CLASSIFICATION IS PER CBC 1802.3

*** THE CONVENTIONAL FOUNDATION INFORMATION ABOVE IS FOR LOTS WITH EXPANSION POTENTIAL NOTED ABOVE AND A TOTAL EXPECTED SOIL SETTLEMENT OF NOT MORE THAN ½"

SLAB & FOOTING SPECIFICATIONS

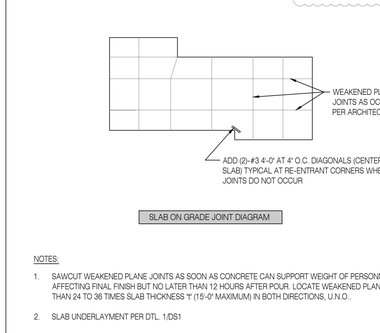
SCALE: N.T.S.

1

STEEL COLUMN BASEPLATE AND FOOTING

SCALE: N.T.S.

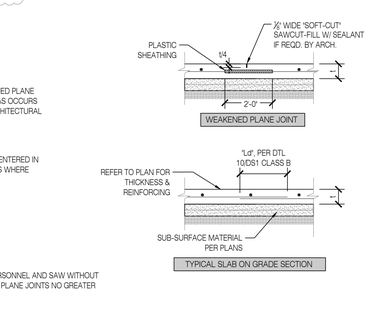
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STEEL COLUMN BASEPLATE AND FOOTING

SCALE: N.T.S.

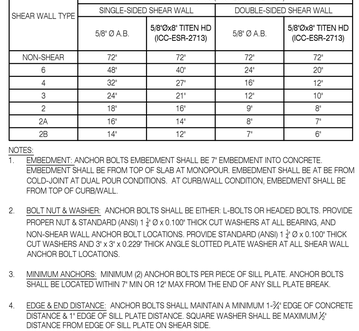
14



FOOTING TRENCH & FINISH GRADE

SCALE: N.T.S.

9

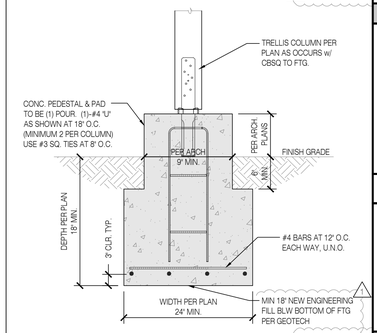


REFER TO MANUFACTURERS CATALOG FOR NUMBER AND SIZE OF FASTENERS TO POST FROM HOLDOWN.

STHD14 HOLDOWN STRAP

SCALE: N.T.S.

6



EXTERIOR FOOTING

SCALE: N.T.S.

2

STEEL COLUMN BASEPLATE AND FOOTING

SCALE: N.T.S.

14

CRITICAL SECTION (JOINT FACE AT STANDARD HOOK, OR OUTSIDE OF TIES (CONFINED) AREA)

CONCRETE STD. HOOK TABLE

STANDARD HOOK DEVELOPMENT LENGTH (Ldh)		
BAR SIZE	f'c= 2,500 psi	
	COVER < 2.50"	COVER ≥ 2.50"
#3	9"	7"
#4	12"	9"
#5	15"	12"
#6	18"	13"
#7	21"	15"
#8	24"	17"
#9	28"	19"

NOTES:
1. REBAR f_y = 60,000psi, MIN.
2. FOR EPOXY-COATED BARS, MULTIPLY THE CORRESPONDING VALUE IN THE TABLE BY 1.20
3. FOR LIGHTWEIGHT CONCRETE, MULTIPLY THE CORRESPONDING VALUE IN TABLE BY 1.33

STANDARD BAR HOOKS AT FOOTING

SCALE: N.T.S.

10

SHEAR WALL TYPE	FOUNDATION ATTACHMENT HARDWARE ALTERNATES MAXIMUM SPACING (INCHES ON CENTER)			
	SINGLE-SIDED SHEAR WALL		DOUBLE-SIDED SHEAR WALL	
	5/8" Ø A.B.	5/8"Øx8" TITEN HD (ICC-ESR-2713)	5/8" Ø A.B.	5/8"Øx8" TITEN HD (ICC-ESR-2713)
NON-SHEAR	72"	72"	72"	72"
6	48"	40"	24"	20"
4	32"	27"	16"	12"
3	24"	21"	12"	10"
2	18"	16"	9"	8"
2A	16"	14"	8"	7"
2B	14"	12"	7"	6"

NOTES:
1. EMBEDMENT: ANCHOR BOLTS EMBEDMENT SHALL BE 7" EMBEDMENT INTO CONCRETE. EMBEDMENT SHALL BE FROM TOP OF SLAB AT MONOPOUR. EMBEDMENT SHALL BE AT BE FROM COLD-JOINT AT DUAL POUR CONDITIONS. AT CURB/WALL CONDITION, EMBEDMENT SHALL BE FROM TOP OF CURB/WALL.
2. BOLT NUT & WASHER: ANCHOR BOLTS SHALL BE EITHER: L-BOLTS OR HEADED BOLTS. PROVIDE PROPER NUT & STANDARD (ANSI) 1 ¼" Ø x 0.100" THICK CUT WASHERS AT ALL BEARING, AND NON-SHEAR WALL ANCHOR BOLT LOCATIONS. PROVIDE STANDARD (ANSI) 1 ¼" Ø x 0.100" THICK CUT WASHERS AND 3" x 3" x 0.229" THICK ANGLE SLOTTED PLATE WASHER AT ALL SHEAR WALL ANCHOR BOLT LOCATIONS.
3. MINIMUM ANCHORS: MINIMUM (2) ANCHOR BOLTS PER PIECE OF SILL PLATE. ANCHOR BOLTS SHALL BE LOCATED WITHIN 7" MIN OR 12" MAX FROM THE END OF ANY SILL PLATE BREAK.
4. EDGE & END DISTANCE: ANCHOR BOLTS SHALL MAINTAIN A MINIMUM 1-¾" EDGE OF CONCRETE DISTANCE & 1" EDGE OF SILL PLATE DISTANCE. SQUARE WASHER SHALL BE MAXIMUM ½" DISTANCE FROM EDGE OF SILL PLATE ON SHEAR SIDE.

TYPICAL SILL PLATE ANCHOR BOLT SPECIFICATIONS

SCALE: N.T.S.

7

INTERIOR BEARING WALL FOOTING

SCALE: N.T.S.

3

NOTES:
1. SAWCUT WEAKENED PLANE JOINTS AS SOON AS CONCRETE CAN SUPPORT WEIGHT OF PERSONNEL AND SAW WITHOUT AFFECTING FINAL FINISH BUT NO LATER THAN 12 HOURS AFTER POUR. LOCATE WEAKENED PLANE JOINTS NO GREATER THAN 24 TO 36 TIMES SLAB THICKNESS 't' (15'-0" MAXIMUM) IN BOTH DIRECTIONS, U.N.O..
2. SLAB UNDERLAYMENT PER DTL. 1/DS1

TYPICAL SLAB ON GRADE DETAILS

SCALE: N.T.S.

11

TYP TRELLIS COLUMN FOOTING

SCALE: N.T.S.

4

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CHRISTIAN@ISEENGINEERS.COM

PROJECT DESIGN ENGINEER:
ANNA SY EXT. 1011
ANNAS@ISEENGINEERS.COM

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CONTACT INFORMATION:

ARCHITECT:
MI ARCHITECTS, INC.
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SUITE 300
WALNUT CREEK, CA 94596
(925) 287-1174

PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE

REGISTERED PROFESSIONAL ENGINEER
ANNA SY
No. C86438
Exp. 03/31/25
CIVIL
STATE OF CALIFORNIA

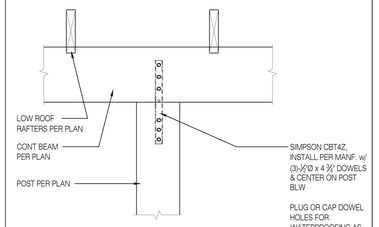
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SHEET TITLE:

STRUCTURAL FOUNDATION DETAILS

SHEET NUMBER:

DS1

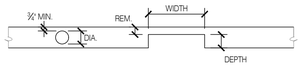


TYPICAL POST TO BEAM CONNECTION

SCALE: N.T.S.

11

TOP PLATES



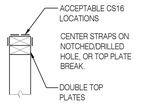
ALLOWABLE NOTCHES AND HOLES IN TOP PLATES				
PLATE SIZE	DEPTH	WIDTH	REMAINING	DIAMETER
2x4	2"	16"	1 ½"	2"
2x6	3 ½"	16"	2"	3 ½"

FOR ALL NOTCHING OR DRILLING GREATER THAN ABOVE, PROVIDE 32" LONG CS16 w/ (16) 8d NAILS EACH SIDE OF NOTCH OR DRILLED HOLE, U.N.O. ON PLAN

ONLY REQUIRED AT EXTERIOR WALLS AND INTERIOR BEARING AND SHEAR WALLS.

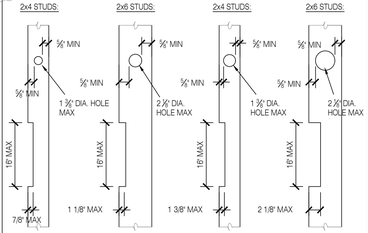
PROVIDE HARDY SADDLE HS24 AT COMPLETELY NOTCHED TOP PLATES

NO STRAPPING REQUIRED IF NOTCHING OR DRILLING OF TOP PLATE IS AS SHOWN.



EXTERIOR / BEARING WALLS

INTERIOR / NON-BEARING WALLS



IF ALLOWABLE CUTS ON STUDS ARE EXCEEDED, PROVIDE SIMPSON HSS STUD SHOES AT EACH NOTCH OR HOLE.

DO NOT NOTCH OR DRILL MORE THAN 3 CONSECUTIVE STUDS.

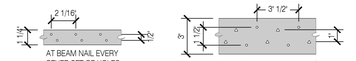
DO NOT NOTCH OR DRILL BALLOON FRAMED STUDS OR STUDS OVER 10'-0"

NOTCHING AND DRILLING OF STUDS AND TOP PLATES

SCALE: N.T.S.

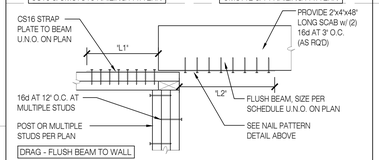
8

DRAG STRAP SPECIFICATIONS					
STRAP	DRAG MEMBER	SCAB LENGTH AND NAILING OF SCAB TO DRAG MEMBER	"L1" LENGTH OF STRAP TO TOP PLT.	"L2" LENGTH OF STRAP TO DRAG MEMBER	DRAG CAPACITY (LBS)
(1) CS16	1 ½" RIM	N/A	16" WITH (15) 8ds	32" w/ (2) ROWS OF 8ds AT 4 ½" O.C.	1,705
(2) CS16	1 ½" RIM w/ 2x SCAB	4' LONG w/ (2) ROWS OF 16ds AT 6" O.C.	16" WITH (15) 8ds	32" w/ (2) ROWS OF 8ds AT 4 ½" O.C.	3,410
CMSTC16	3" MIN.	N/A	20" WITH (25) 16d SINKER	40" w/ (2) ROWS OF 16d SINKERS AT 3" O.C.	4,690
CMST14	3 ½" MIN.	N/A	34" WITH (38) 10ds	72" w/ (2) ROWS OF 10ds AT 3 ½" O.C.	6,490
CMST12	3 ½" MIN.	N/A	44" WITH (49) 10ds	96" w/ (2) ROWS OF 10ds AT 3 ½" O.C.	9,215

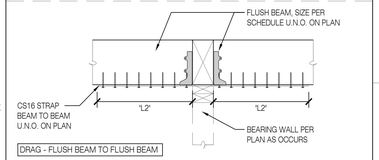


CS16 & CMSTC16 NAILING PATTERN

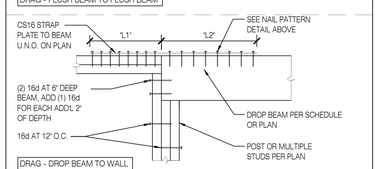
CMST12 & 14 NAILING PATTERN



DRAG - FLUSH BEAM TO WALL



DRAG - FLUSH BEAM TO FLUSH BEAM

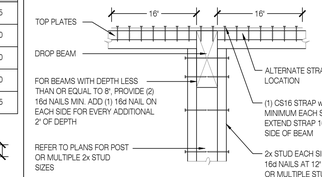


DRAG - DROP BEAM TO WALL

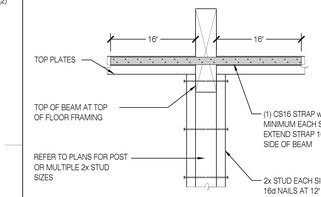
DRAG STRAP TO BEAM OR JOIST CONNECTION

SCALE: N.T.S.

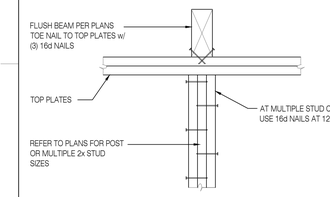
7



DROP BEAM CONNECTION



TOP FLUSH DROP BEAM CONNECTION



FLUSH BEAM CONNECTION

BEAM DRAG CONNECTIONS

SCALE: N.T.S.

6

VERTICAL WOOD FRAMED SHEAR WALL SCHEDULE - 2022 CBC / AF&PA SDPWS-2021 - SEISMIC DESIGN CATEGORY D, E & F - LA REGION													
MARK	WOOD STRUCTURAL PANEL			PANEL NAILING			SHEAR WALL SILL PLATE				FRAMING MEMBER THICKNESS AT ADJOINING PANEL EDGES	ASD CAPACITY (PLF) (DOUGLAS FIR)	
	THICK (IN)	GRADE RATING	SPAN RATING	NAIL SIZE	EDGE NAIL ON CENTER SPACING	FIELD NAIL ON CENTER SPACING	NOMINAL PLATE THICKNESS	⅝" Ø ANCHOR SPACING TO CONC.	TO WOOD FRAMING			SEISMIC	WIND
									FASTENER	SPACING			
6	1/2	SHEATHING	24/0	8d	6"	12"	2x	48"	16d (3 ½" x 0.131")	4"	2x	260	365
4	1/2	SHEATHING	24/0	8d	4"	12"	2x	32"	¼"Ø x 3" SDS SCREW	12"	2x	350	532
3	1/2	SHEATHING	24/0	8d	3"	12"	2x	24"	¼"Ø x 3" SDS SCREW	8"	3x	490	685
2	1/2	SHEATHING	24/0	8d	2"	12"	2x	16"	¼"Ø x 3" SDS SCREW	6"	3x	640	895
2A	1/2	STRUCTURAL I	24/0	8d	2"	12"	2x	16"	¼"Ø x 3" SDS SCREW	6"	3x	730	1022
2B	1/2	STRUCTURAL I	32/16	10d	2"	12"	2x	12"	¼"Ø x 3" SDS SCREW	4"	3x	870	1217

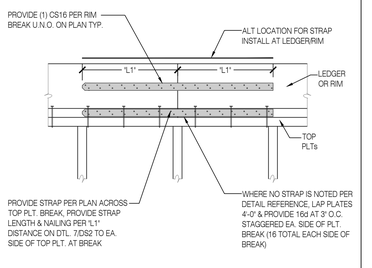
SHEAR WALL NOTES:

1. PANEL NAILS - MAY BE EITHER COMMON OR GALVANIZED BOX. GALVANIZED NAILS ARE REQUIRED WHEN PENETRATING PRESSURE TREATED LUMBER THAT CONTAINS TREATMENTS OTHER THAN BORATE.
2. PANEL RATING - WOOD PANELS MAY CONSIST OF EITHER OSB OR 5-PLY PLYWOOD WITH A MINIMUM EXPOSURE 1 RATING.
3. STUD SPACING - 2x WOOD STUDS AT SHEAR WALL SHALL BE SPACED A MAXIMUM OF 24" ON CENTER.
4. PANEL BREAKS - ALL PANELS EDGES SHALL BE 2x BLOCKED IF OCCURS.
5. STAGGERED NAILS - ALL NAILING AT 2" O.C. OR CLOSER SHALL BE STAGGERED.
6. SILL PLATE ANCHOR BOLT WASHERS - SHALL BE 0.229" x 3" x 3" STEEL PLATE WASHERS WITH A DIAGONALLY SLOTTED HOLE NO LARGER THAN 3/16" GREATER THAN THE BOLT DIAMETER OR 1 ¾" MAXIMUM. THE WASHER SHALL BE PLACED BETWEEN THE NUT AND SILL PLATE AND SHALL NOT BE OFFSET BY MORE THAN 1/2" OF THE EDGE OF THE SILL PLATE ON THE SIDE WITH SHEATHING ATTACHMENT.
7. DOUBLE SIDED SHEAR WALLS - MEMBERS SHALL BE 3x AT ALL ADJOINING PANEL EDGES AND NAILS SHALL BE STAGGERED ON EACH SIDE OF THE PANEL BREAK ON EACH SIDE OF THE ADJOINING MEMBER. SILL PLATE FASTENER SPACING SHALL BE REDUCED BY A FACTOR OF 1/2.

SHEAR WALL SCHEDULE

SCALE: N.T.S.

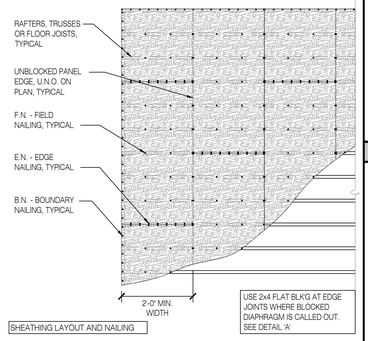
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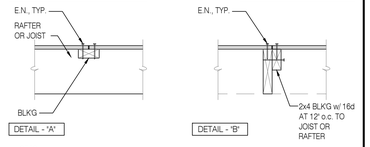
TOP PLATE AND RIM SPLICE

SCALE: N.T.S.

4



SHEATHING LAYOUT AND NAILING



NOTES:

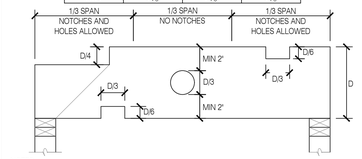
1. RUN LONG DIMENSION OF SHEATHING ACROSS (PERPENDICULAR TO) JOIST AND RAFTERS. PANELS SHALL BE SPACED ⅛" FOR THERMAL EXPANSION.
2. STAGGER END JOINTS 2'-0" MINIMUM.
3. BOUNDARY NAILING APPLIES TO PERIMETER PLATE LINES, CHORDS, TIES, AND AS CALLED FOR ON DRAWINGS.
4. SEE PLANS FOR NAILING AT BLOCKED DIAPHRAGMS.
5. NAILS SHALL HAVE ⅜" MIN. EDGE DISTANCE.
6. ALL JOISTS AND RAFTERS SHALL BE LAID OUT IN 4'-0" MODULE TO COINCIDE WITH THE SHEATHING.
7. USE TONGUE-AND-GROOVE SHEATHING AT FLOORS, UNLESS NOTED OTHERWISE.
8. SEE DETAIL 'B' FOR FRAMING WHERE SHEATHING JOINTS ARE OFFSET DUE TO RAFTER OR JOIST LAP SPLICES.
9. PROVIDE A ⅛" GAP BETWEEN ALL PANEL EDGES TYPICAL.

HORIZONTAL DIAPHRAGM LAYOUT AND NAILING SCHEDULE

SCALE: N.T.S.

2

JOIST SIZE	MAX. NOTCH WIDTH: D/3	MAX. NOTCH DEPTH: D/6	MAX HOLE SIZE: D/3
2x6	1 ½"	½"	1 ½"
2x8	2 ½"	1 ½"	2 ½"
2x10	3"	1 ½"	3"
2x12	3 ½"	1 ½"	3 ½"
2x14	4 ½"	2 ½"	4 ½"



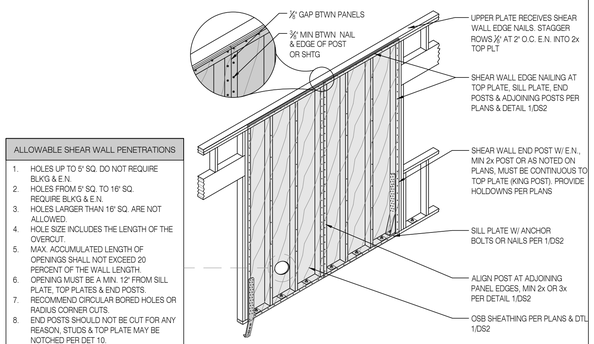
NOTES:

1. HOLES MAY BE DRILLED IN ANY 1/3 SPAN. HOLES MUST BE A MIN 12" FROM ANY NOTCH.
2. DO NOT NOTCH BOTH TOP AND BOTTOM SURFACES WITHIN THE SAME 1/3 SPAN.
3. MAX ALLOWED IS A COMBINATION OF TWO NOTCHES AND/OR HOLES PER 1/3 SPAN.
4. THIS DETAIL DOES NOT APPLY TO NOTCHES AND HOLES IN STRUCTURAL BEAMS, THEY MUST BE SPECIFICALLY DETAILED.
5. NOTCHES AND HOLES ARE NOT ALLOWED IN CANTILEVERED JOISTS.
6. REFERT TO MANUFACTURER'S RECOMMENDATIONS FOR HOLES IN MANUFACTURED I-JOISTS. DO NOT NOTCH I-JOISTS.

NOTCHED OR DRILLED CONVENTIONAL JOISTS

SCALE: N.T.S.

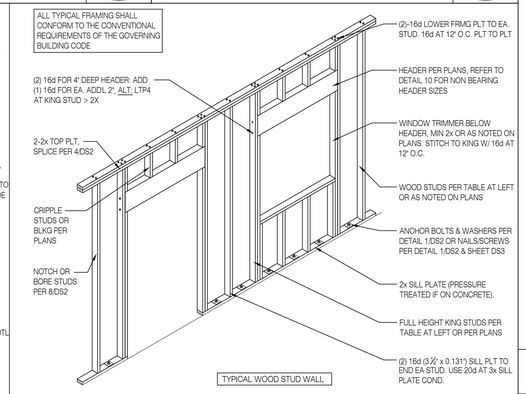
9



ALLOWABLE SHEAR WALL PENETRATIONS
1. HOLES UP TO 5" SQ. DO NOT REQUIRE BLKG & E.N.
2. HOLES FROM 5" SQ. TO 16" SQ. REQUIRE BLKG & E.N.
3. HOLES LARGER THAN 16" SQ. ARE NOT ALLOWED.
4. HOLE SIZE INCLUDES THE LENGTH OF THE OVERCUT.
5. MAX. ACCUMULATED LENGTH OF OPENINGS SHALL NOT EXCEED 20 PERCENT OF THE WALL LENGTH.
6. OPENING MUST BE A MIN. 12" FROM SILL PLATE, TOP PLATES & END POSTS.
7. RECOMMEND CIRCULAR BORED HOLES OR RADIUS CORNER CUTS.
8. END POSTS SHOULD NOT BE CUT FOR ANY REASON, STUDS & TOP PLATE MAY BE NOTCHED PER DET 10.

TYPICAL WOOD SHEAR WALL - CONDITION A

ALL TYPICAL FRAMING SHALL CONFORM TO THE CONVENTIONAL REQUIREMENTS OF THE GOVERNING BUILDING CODE



TYPICAL WOOD STUD WALL

KING STUD / POST REQUIREMENTS					
WALL WIDTH	*WIDTH OF WDW/DOOR	# KING STUDS	ALT: POST	***NAILS (PLATE TO KING STUD/POST)	
5½"	0-10"	(1) 2x6	--	(4)-16d (20d AT 3x SILL)	
	10'-18'	(2) 2x6	4x6	(8)-16d (20d AT 3x SILL)	

* WIDTH IS THE DISTANCE BTW KING STUDS AT EACH SIDE OF WINDOW/DOOR.

** (1) 2x KING STUD REQ'D WHEN FULL HEIGHT HARDY/SIMPSON PANEL IS ADJACENT TO WDW/DOOR, SCREW STUD TO HARDY.

*** NAILS SHOULD BE SPREAD EVENLY TO ALL STUDS OR ALL INTO POST, AT POST CONDITION

WOOD STUD SIZE TABLE		
WALL WIDTH	STUD HEIGHT	STUD SIZE AND SPACING
5 ½"	≤ 14'-6"	2x6 AT 16" O.C.

1. STUD HEIGHT MEASURED FROM SILL PLATE TO TOP OF SHEATHING, REFER TO SHEET DS3 FOR MAX. STUD EXTENSION PAST TOP OF SHEATHING
2. INTERIOR NON-BEARING / NON-SHEAR WALLS MAY USE A STUD SPACING OF 24" ON CENTER.

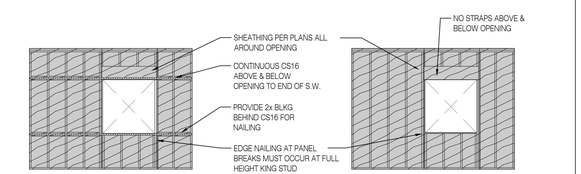
NON-BEARING HEADER SCHEDULE	
HEADER SIZE	MAXIMUM SPAN (3'-0" WALL ABOVE)
2x4 FLAT*	4'-0"

*THE USE OF A SINGLE 2x4 FLAT HEADER IS ACCEPTABLE ONLY WHEN USED IN CONJUNCTION WITH A MINIMUM SINGLE 2x4 TOP PLATE.

NON-BEARING HEADER SCHEDULE

SCALE: N.T.S.

10



PERFORATED SHEAR WALL - CONDITION C (STRAPS)

PERFORATED SHEAR WALL - CONDITION B (NO STRAPS)

TYPICAL WOOD BEARING/EXTERIOR STUD WALL AND SHEAR WALL FRAMING

SCALE: N.T.S.

5

HORIZONTAL DIAPHRAGM SCHEDULE - 2022 CBC					
MAXIMUM SPACING	PANEL DESCRIPTION	NAIL SIZE	EDGE NAILING	BOUNDARY NAILING	FIELD NAILING
ROOF 48" O.C.	7/16" WOOD STRUCTURAL PANEL, PII 48/24	10d	6" o.c.	6" o.c.	12" o.c.

NOTES:

1. ALL ROOF AND FLOOR SHEATHING TO BE EXPOSURE 1 OR EXTERIOR PER TABLE 2306.3.1. 7/16" SHEATHING IS NOT STRUCTURALLY ACCEPTABLE FOR ROOF SHEATHING.
2. FOR FLOOR SHEATHING, WOOD STRUCTURAL PANEL SHALL BE UNDERLAYMENT GRADE. ALL FLOOR SHEATHING SHALL BE GLUED TO FRAMING.
3. ALL ROOF NAILS MUST BE 8d. ALL FLOOR NAILS MUST BE 10d. IN LIEU OF 10d NAILS AT FLOOR SHEATHING, #8 x 2" LONG SCREWS MAY BE USED.
4. FOR ALL FLOOR SHEATHING, PANEL EDGES SHALL HAVE APPROVED TONGUE-AND -GROOVE JOINTS OR SHALL BE SUPPORTED WITH BLOCKING. NOT REQUIRED WHEN LIGHTWEIGHT CONCRETE IS PLACED OVER THE SUBFLOOR.

HORIZONTAL ROOF AND FLOOR SHEATHING SCHEDULE

SCALE: N.T.S.

3

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PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE



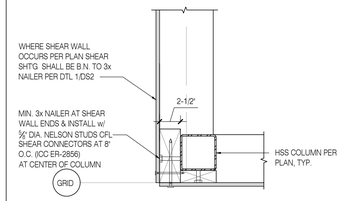
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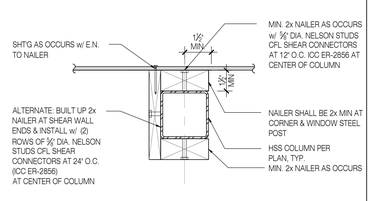
GENERAL WOOD FRAMING DETAILS

SHEET NUMBER:

DS2



PLAN VIEW - WOOD NAILER AT CORNER COLUMN

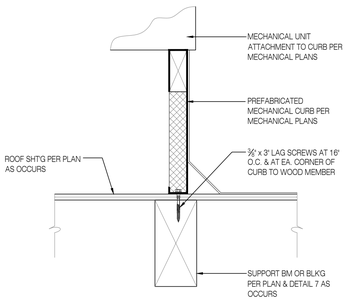


PLAN VIEW - WOOD NAILER AT HSS COLUMN OR BEAM

TYPICAL WOOD NAILER TO STEEL HSS COLUMNS AND BEAMS

SCALE: N.T.S.

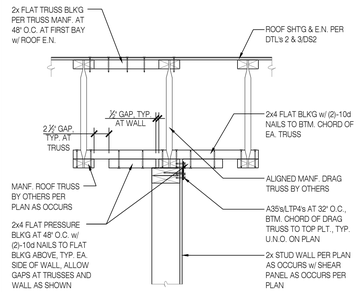
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MECHANICAL CURB ATTACHMENT

SCALE: N.T.S.

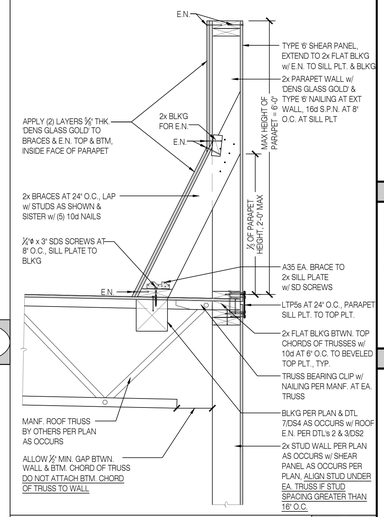
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ALIGNED DRAG TRUSS AT INTERIOR WALL

SCALE: N.T.S.

4



PARAPET WALL AT ROOF JOISTS PERPENDICULAR CONDITION

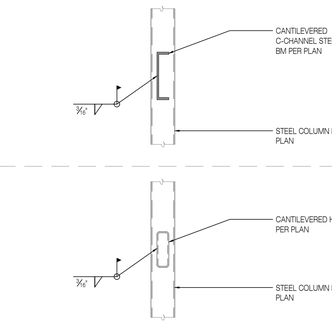
SCALE: N.T.S.

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HSS CONNECTION AT TOP PLT

SCALE: N.T.S.

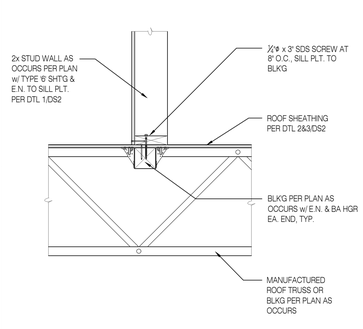
13



OVERHANG AT FRONT OF STORE SOFFIT FRAMING

SCALE: N.T.S.

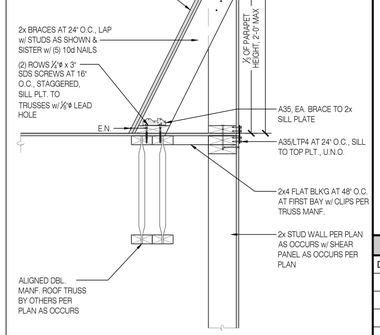
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TOWER ROOF WALL AT TRUSS PARALLEL CONDITION

SCALE: N.T.S.

5



PARAPET WALL AT ROOF JOISTS PARALLEL CONDITION

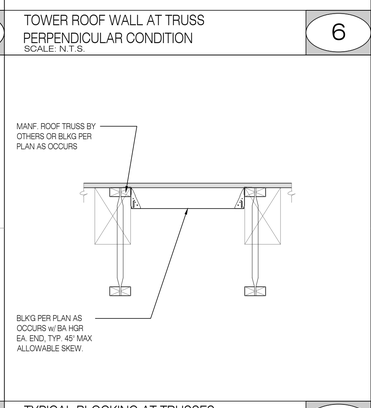
SCALE: N.T.S.

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BEAM TO COLUMN CONNECTION AT AWNING

SCALE: N.T.S.

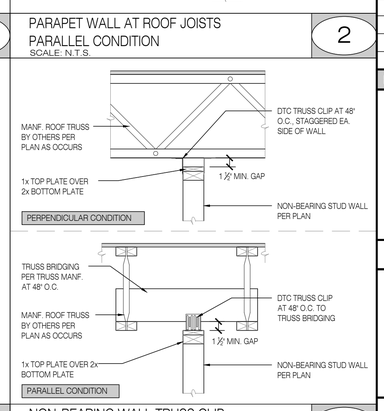
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TOWER ROOF WALL AT TRUSS PERPENDICULAR CONDITION

SCALE: N.T.S.

6



NON-BEARING WALL TRUSS CLIP

SCALE: N.T.S.

3

BEAM TO BEAM CONNECTION AT AWNING

SCALE: N.T.S.

11

TYPICAL BLOCKING AT TRUSSES

SCALE: N.T.S.

7

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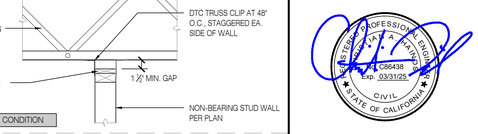
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PLAN REVISIONS

DELTA	DESCRIPTION	DATE
1	PC1	11/22/2023

ENGINEER STAMP & SIGNATURE



DATE: 12/4/2023

SHEET TITLE:

STRUCTURAL ROOF FRAMING DETAILS

SHEET NUMBER:

DS4

HVAC GENERAL NOTES

1. CONTRACTOR SHALL CAREFULLY REVIEW THESE PLANS AND SPECIFICATIONS PRIOR TO BID. CONTRACTOR SHALL ALSO REVIEW PLANS AND SPECIFICATIONS OF OTHER RELATED TRADES (INCLUDING ARCHITECTURAL, CIVIL, STRUCTURAL AND ELECTRICAL) PRIOR TO BID TO ENSURE AN ACCURATE UNDERSTANDING OF EXACT SCOPE OF WORK. ANY ITEMS REQUIRING CLARIFICATION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN SUFFICIENT TIME TO BE INCORPORATED INTO THE BID.
2. CONTRACTOR SHALL VERIFY ALL EQUIPMENT MODEL NUMBERS, CAPACITIES, SIZES, VOLTAGES, AND ALL OTHER SCHEDULED INFORMATION WITH ALL OTHER APPLICABLE TRADES AND WITH THE MANUFACTURER PRIOR TO INSTALLATION.
3. CONTRACTOR SHALL VERIFY ALL LOCATIONS, SIZES, P.O.C.'s, AND AVAILABILITY OF ALL EXISTING ITEMS (I.E.: OUTSIDE AIR, EXHAUST ETC.) PRIOR TO INSTALLATION OF ANY MATERIAL OR EQUIPMENT.
4. THESE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND ARE NOT INTENDED TO INDICATE ALL NECESSARY OFFSETS OF DUCTWORK AND PIPING. THE CONTRACTOR SHALL INSTALL MATERIAL AND EQUIPMENT IN A MANNER AS TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM, AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. ALL INSTALLATIONS SHALL BE CONSISTENT WITH NORMALLY ACCEPTABLE INDUSTRY STANDARDS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES OR CONFLICTS THAT WOULD AFFECT THE SYSTEM PERFORMANCE OR WHICH WOULD INCUR ADDITIONAL COSTS. THIS NOTIFICATION SHALL BE MADE PRIOR TO THE INSTALLATION OF THE ITEMS CONCERNED.
5. NEW AND/OR EXISTING EQUIPMENT INDICATED ON THIS DRAWING IS SHOWN IN APPROXIMATE POSITION(S). CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING EQUIPMENT LOCATIONS, P.O.C.'s AND STRUCTURAL MEMBERS PRIOR TO INSTALLATION. IN ALL CASES, ADEQUATE ACCESS (PER MANUFACTURER'S RECOMMENDATIONS AND CODE COMPLIANCE) FOR MAINTENANCE AND REPLACEMENT OF EQUIPMENT SHALL BE PROVIDED.
6. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES. NOTHING SHOWN IN THE PLANS OR STATED IN THE SPECIFICATIONS IS INTENDED TO INDICATE THAT THE INSTALLATION OF CONNECTIONS OF ANY ITEM OR DEVICE SHOULD BE DONE CONTRARY TO THE MANUFACTURER'S INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE INSTALLATION AND CONNECTIONS OF ALL ITEMS AND DEVICES CONFORM TO MANUFACTURER'S INSTRUCTIONS AND TO ALL APPLICABLE CODES AND REGULATIONS.
7. ALL HVAC EQUIPMENT, MATERIAL, AND ALL CONNECTION THERETO SHALL BE INSTALLED COMPLETE PER MANUFACTURER'S INSTRUCTIONS TO PROVIDE A COMPLETE AND FULLY OPERATIONAL SYSTEM.
8. DUCT SIZES INDICATED ON DRAWINGS ARE INSIDE NET CLEARANCE DIMENSIONS.
9. CONTRACTOR MAY, AT HIS OPTION, WITH PRIOR APPROVAL FROM ENGINEER REVISE DUCTWORK SIZING AND ROUTING TO ALLOW FOR INSTALLATION IN THE AVAILABLE SPACE. DUCTWORK THAT IS RESIZED MUST MAINTAIN THE SAME CROSS-SECTIONAL AREA.
10. ALL NEW SUPPLY, RETURN, AND EXHAUST (AIR DISTRIBUTION) GRILLES, REGISTERS, AND DIFFUSERS SHALL MATCH (IF APPLICABLE) EXISTING, AND BE APPROVED BY ARCHITECT. THE MAXIMUM NOISE NC LEVEL SHALL BE 25.
11. ALL SUPPLY, RETURN, AND EXHAUST REGISTER CONNECTIONS TO DUCTWORK SHALL BE PROVIDED WITH ACCESSIBLE MANUAL VOLUME DAMPERS. ALTERNATIVELY, ACCESSIBLE MANUAL VOLUME DAMPERS MAY BE PROVIDED IN DUCT WORK FEEDER LINES SERVING INDIVIDUAL REGISTERS. PROVIDE ACCESS DOOR AND PANEL AS REQUIRED.
12. SUBSTITUTION OF HVAC EQUIPMENT WITH EFFICIENCIES LOWER THAT THOSE INDICATED ON THE PLANS IS NOT PERMITTED.
13. IF THE CONTRACTOR'S USE OF SUBSTITUTE MATERIALS, EQUIPMENT, OR METHODS OF INSTALLATION REQUIRES ANY CHANGES IN OTHER TRADES' WORK FROM THAT SHOWN ON THE DRAWINGS, THE EXTRA COST OF THE OTHER TRADES WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR INITIATING THE SUBSTITUTION.
14. SUBMITTALS: APPROVAL OF SUBMITTALS DOES NOT RELEASE THE CONTRACTOR FROM OBLIGATIONS TO COMPLY WITH ALL REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS OR APPLICABLE CODE REGULATIONS.
15. WHERE NONMETALLIC PIPING PENETRATES AREA SEPARATION WALLS, THE PIPE SECTION PASSING THROUGH THE WALLS AND THE FIXTURE CONNECTIONS THERETO SHALL BE OF METAL ONLY.
16. NO RANGE HOODS, DRYER VENTS, COMBUSTION VENTS, OR HEATING DUCTS ARE PERMITTED IN AREA SEPARATION WALLS.
    A. CONTRACTOR TO VERIFY LOCATION OF FIRE AND FIRE/SMOKE BARRIER WALLS WITH ARCHITECT PRIOR TO FIRE AND/OR SMOKE DAMPER, DETECTOR AND ACTUATOR INSTALLATION.
    B. ALL CEILING FIRE DAMPERS TO BE ONE (1) HOUR U.L. AND C.S.F.M. APPROVED.
    C. ALL ONE HOUR WALL SHALL BE APPROVED WITH ONE HOUR FIRE DAMPERS BOTH U.L. AND C.S.F.M. APPROVED.
    D. ALL TWO HOUR WALLS SHALL BE APPROVED WITH TWO HOUR FIRE DAMPERS BOTH U.L. AND C.S.F.M. APPROVED.
    E. ALL SMOKE BARRIER WALLS SHALL BE PROVIDED WITH U.L. AND C.S.F.M. APPROVED SMOKE/FIRE DAMPERS (EQUAL TO WALL RATING), MOTOR, ACTUATOR, AND SMOKE DETECTOR.
    F. ALL PENETRATIONS OF ONE (1) HOUR CORRIDOR WALLS AND CEILINGS THAT WOULD REQUIRE THE INSTALLATION OF A FIRE DAMPER SHALL BE APPROVED WITH A U.L. AND C.S.F.M. APPROVED COMBINATION SMOKE/FIRE DAMPER, (EQUAL TO WALL RATING), MOTOR, ACTUATOR, AND SMOKE DETECTOR.
    G. PROVIDE ALL FIRE & SMOKE DAMPERS WITH ACCESS DOORS AS NECESSARY.
17. PROVIDE BALANCING DAMPERS ON ALL OUTSIDE AIR, EXHAUST AIR, SUPPLY AIR AND RETURN AIR SYSTEMS THROUGH OUT. DAMPERS ARE NOT INDICATED ON PLANS BUT ARE REQUIRED AT ALL BRANCH TAKE-OFFS.
18. PROVIDE TURNING VANES ON ALL 90 DEGREE SQUARE ELBOWS.
19. PROVIDE FLEXIBLE DUCT CONNECTIONS WITH MINIMUM 1" GAP ON THE SUPPLY AND RETURN DUCT CONNECTIONS ON ALL FANS.
20. ALL SUPPLY AND RETURN DUCTWORK FROM AC UNITS AND FANS SHALL BE LINED WITH 1" ACOUSTIC INSTALLATION TO MINIMUM 15 FEET FROM THE FAN UNLESS NOTED TO BE LONGER. PROVIDE PERFORATED LINING. DUCT SIZE SHALL BE INCREASED TO PROVIDE THE CLEAR INSIDE DIMENSIONS AS NOTED ON PLANS.
21. VERIFY MECHANICAL EQUIPMENT LOCATION & DUCT ROUTING WITH ENGINEERING PRIOR TO CONSTRUCTION.
22. FACTORY-MADE FLEXIBLE AIR DUCTS AND CONNECTORS SHALL BE NOT MORE THAN 5 FEET IN LENGTH AND SHALL NOT BE USED IN LIEU OF RIGID ELBOWS OR FITTINGS. FLEXIBLE AIR DUCTS SHALL BE PERMITTED TO BE USED AS AN ELBOW AT A TERMINAL DEVICE.

CALIFORNIA GREEN BUILDING STANDARDS CODE 2022

1. ALL HVAC DUCTS ARE REQUIRED TO BE SEALED WITH MASTIC AND SHALL BE TESTED. CONCEALED DUCT SHALL BE INSULATED WITH MIN R-8 DUCT INSULATION.
2. AT THE TIME OF ROUGH INSTALLATION OR DURING STORAGE ON THE CONSTRUCTION SITE AND UNTIL START-UP PF THE HEATING AND COOLING EQUIPMENT, ALL DUCTS AND OTHER RELATED AIR DISTRIBUTION COMPONENT EQUIPMENT SHALL BE COVERED WITH TAPE, PLASTIC, SHEETMETAL OR OTHER METHODS ACCEPTABLE TO THE ENFORCING AGENCY TO REDUCE THE AMOUNT OF DUST OR DEBRIS WHICH MAY COLLECT IN THE SYSTEM. CGBC 5.504.3
3. BASED ON THESE PLANS, THE MECHANICAL/BALANCING CONTRACTOR SHALL PROVIDE A TESTING AND ADJUSTING PLAN AND SHALL FOLLOW IT AS PER CALIFORNIA GREEN BUILDING STANDARDS CODE. SECTION 5.410.4.
4. IN MECHANICAL VENTILATED BUILDINGS, PROVIDE REGULARLY OCCUPIED AREAS OF THE BUILDING WITH AIR FILTRATION MEDIA FOR OUTSIDE AND RETURN AIR PRIOR OCCUPANCY THAT PROVIDES AT LEAST A MERV 8. CGBC 5.504.5.3
5. BUILDINGS SHALL MEET OR EXCEED THE PROVISIONS OF CALIFORNIA BUILDING CODE, CCR, TITLE 24, PART 2, SECTIONS 1203 (VENTILATION) AND CHAPTER 14 (EXTERIOR WALLS). FOR ADDITIONAL MEASURES NOT APPLICABLE TO LOW-RISE RESIDENTIAL OCCUPANCIES, SEE SECTION 5.407.2 OF THIS CODE. CGBC 5.505.1
6. FOR MECHANICALLY OR NATURALLY VENTILATED SPACES IN BUILDINGS, MEET THE MINIMUM REQUIREMENTS OF SECTION 120.1 (REQUIREMENTS FOR VENTILATION) OF THE 2019 CALIFORNIA ENERGY CODE, OR THE APPLICABLE LOCAL CODE, WHICHEVER IS MORE STRINGENT, AND DIVISION 1, CHAPTER 4 OF CCR, TITLE 8. CGBC 5.506.1
7. FOR BUILDINGS OR ADDITIONS EQUIPPED WITH DEMAND CONTROL VENTILATION, CO2 SENSORS AND VENTILATION CONTROLS SHALL BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE 2019 CALIFORNIA ENERGY CODE, SECTION 120(C)(4). CGBC 5.506.2
8. TESTING AND ADJUSTING SYSTEMS SHALL BE REQUIRED FOR BUILDING LESS THAN 10,000 SQFT. CGBC 5.410.4.
9. DEVELOP A WRITTEN PLAN OF PROCEDURES FOR TESTING AND ADJUSTING SYSTEMS. SYSTEMS TO BE INCLUDED FOR TESTING AND ADJUSTING SHALL INCLUDE, AS APPLICABLE TO THE PROJECT, THE SYSTEMS LISTED IN SECTION 5.410.4.2.
10. PERFORM TESTING AND ADJUSTING PROCEDURES IN ACCORDANCE WITH APPLICABLE STANDARDS ON EACH SYSTEM AS DETERMINED BY THE ENFORCING AGENCY. 5.410.4.3. BEFORE A NEW SPACE-CONDITIONING SYSTEM SERVING A BUILDING IS OPERATED FOR NORMAL USE, BALANCE IN ACCORDANCE WITH THE PROCEDURES DEFINED BY NATIONAL STANDARDS LISTED IN SECTION 5.410.4.3.1. OR AS APPROVED BY THE ENFORCING AGENCY.
11. AFTER COMPLETION OF TESTING, ADJUSTING AND BALANCING, PROVIDE A FINAL REPORT OF TESTING SIGNED BY THE INDIVIDUAL RESPONSIBLE FOR OPERATING THESE SERVICES.
12. PROVIDE THE BUILDING OWNER WITH DETAILED OPERATING AND MAINTENANCE INSTRUCTIONS AND COPIES OF WARRANTIES FOR EACH SYSTEM PRIOR TO FINAL INSPECTION. INCLUDE A COPY OF ALL INSPECTION VERIFICATIONS AND REPORTS REQUIRED BY THE ENFORCING AGENCY.
13. IF THE HVAC SYSTEM IS USED DURING CONSTRUCTION, USE RETURN AIR FILTERS WITH A MERV OF 8, BASED ON ASHRAE 52.2-1999, OR AN AVERAGE EFFICIENCY OF 30% BASED ON ASHRAE 52.1-1992. REPLACE ALL FILTERS IMMEDIATELY PRIOR TO OCCUPANCY. APPLIES TO ADDITIONS OR ALTERATIONS.
14. INSTALL HVAC AND REFRIGERATION EQUIPMENT THAT DOES NOT CONTAIN CFCs. CGBG 5.508.1.1.
15. INSTALL FIRE SUPPRESSION EQUIPMENT THAT DOES NOT CONTAIN HALONS. CGBC 5.508.1.2.
16. ADHESIVES, ADHESIVE BONDING PRIMERS, ADHESIVE PRIMERS, SEALANT, SEALANT PRIMERS AND CAULS SHALL COMPLY WITH LOCAL OR REGIONAL AIR POLLUTION CONTROL OR AIR QUALITY MANAGEMENT DISTRICT RULES WHERE APPLICABLE, OR SCAQMD RULE 1168 VOC LIMITS, AS SHOWN IN CALGREEN TABLES 5.504.4.2. SUCH PRODUCTS SHALL COMPLY WITH THE RULE 1168 PROHIBITION ON THE USE OF CERTAIN TOXIC COMPOUNDS (CHLOROFORM, ETHYLENE DICHLORIDE, METHYLENE CHLORIDE, PERCHLOROETHYLENE AND TRICHLOROETHYLENE), EXCEPT FOR AEROSOL PRODUCTS AS SPECIFIED BELOW. AEROSOL ADHESIVES, AND SMALLER UNIT SIZES OF ADHESIVES, AND SEALANT OR CAULKING COMPOUNDS)IN UNITS OF PRODUCT, LESS PACKAGING, WHICH DO NOT WEIGH MORE THAN ONE POUND AND DO NOT CONSIST OF MORE THAN 16 FUILD OUNCES) SHALL COMPLY WITH STATEWIDE VOC STANDARDS AND OTHER REQUIREMENTS, INCLUDING PROHIBITIONS ON USE OF CERTAIN TOXIC COMPOUNDS, OF CALIFORNIA CODE OF REGULATIONS, TITLE 17, COMMENCING WITH SECTION 94507.

DUCT TESTING AND INSULATION

1. ALL DUCTWORK SHALL BE SEALED AND PRESSURE TESTED FOR LEAKS PER SMACNA REQUIREMENTS IN THE "HVAC AIR DUCT LEAKAGE TEST MANUAL" AND THE CALIFORNIA GREEN BUILDING 2022 STANDARDS.
2. INSULATE ALL DUCTWORK AND PIPES PER THE 2022 CALIFORNIA MECHANICAL CODE AND TITLE 24 REQUIREMENT. ALL DUCTWORK SHALL BE INSULATED WITH WOOL FIBER OR FIBERGLASS INSULATION WITH FSK VAPOR BARRIER. ALL PIPES (INCLUDING CONDENSATE PIPING) SHALL BE INSULATED WITH EARTHWOOL FIBERGLASS PIPE INSULATION WITH ASJ+SSL FACING. REFRIGERANT PIPING SHALL BE INSULATED WITH CLOSED CELL INSULATION. ALL DUCTS AND PIPES EXPOSED TO WEATHER (DUCTWORK IN CRAWL SPACES ARE CLASSIFIED AS DUCTWORK EXPOSED TO WEATHER), INCLUDING REFRIGERANT PIPING, SHALL BE PROVIDED WITH ALUMINUM OR SS JACKET INSTALLED PER MANUFACTURER'S PRINTED INSTALLATION MANUAL.
3. FOR PROJECTS WITH EXISTING DUCTS, PERFORM DUCT CLEANING PER THE "NATIONAL DUCT CLEANERS ASSOCIATION". CLEAN EXISTING DIFFUSERS, GRILLES AND REGISTERS WITHOUT DAMAGING PAIN OR COATING. IF THE DAMAGE IS EXISTING, INFORM ARCHITECT AND TAKE PHOTOS BEFORE PERFORMING CLEANING PROCEDURE.

SPECIAL HANGING REQUIREMENTS

1. FOR ALL ITEMS AND EQUIPMENT BEING SUPPORTED FROM ROOF DECK, SUBMIT COORDINATION DRAWINGS CLEARLY SHOWING DETAILS OF FIELD CONNECTIONS, ANCHORAGE, AND THE RELATIONSHIP TO THE WORK OF OTHERS.
2. MECHANICAL CONTRACTOR TO PROVIDE HANGER SUPPORTS AND SEISMIC BRACING AS NEEDED PER LATEST SMACNA SEISMIC RESTRAINT MANUAL. SUBMIT SHOP DRAWING AND HANGER DATA SHEET FOR APPROVAL.

MECHANICAL SPECIFICATIONS

1. GENERAL PROVISIONS – THE GENERAL CONDITIONS, SUPPLEMENTS AND AMENDMENTS SHALL GOVERN THIS DIVISION OF THE SPECIFICATIONS.
2. PROJECT REQUIREMENTS – PROVIDE ALL ITEMS, MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THE WORK OR OPERATIONS MENTIONED HEREIN, OR INDICATED ON THE DRAWINGS AND REASONABLY INFERRED THEREIN, AS REQUIRED TO MAKE A COMPLETE AND WORKING SYSTEM.
3. INTENT – WORK SHALL BE DONE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND THEIR INTENT, COMPLETE WITH ALL NECESSARY COMPONENTS, INCLUDING THOSE NOT NORMALLY SHOWN OR CALLED FOR, AND SHALL BE READY FOR OPERATION BEFORE ACCEPTANCE.

   ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES. NOTHING SHOWN IN THE PLANS OR STATED IN THE SPECIFICATIONS IS INTENDED TO INDICATE THAT THE INSTALLATION OR CONNECTIONS OF ANY ITEM OR DEVICE SHOULD BE DONE CONTRARY TO MANUFACTURERS INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE INSTALLATION AND CONNECTIONS OF ALL ITEMS AND DEVICES CONFORMS TO MANUFACTURERS INSTRUCTIONS AND TO ALL APPLICABLE CODES AND REGULATIONS.

   ANY REFERENCE TO THE DESIGN AUTHORITY SHALL MEAN MR ENGINEERING, INC.

   THE WORK "PROVIDE" SHALL MEAN "SUPPLY AND INSTALL" UNLESS OTHERWISE INDICATED.
4. GOVERNING REGULATIONS – THE WORK UNDER MECHANICAL SCOPE OF WORK, SHALL CONFORM, BUT NOT LIMITED TO THE REQUIREMENTS OF THE FOLLOWING CODES, REGULATIONS AND STANDARDS:

   – 2022 EDITIONS OF THE CALIFORNIA BUILDING CODE, INCLUDING BUT NOT LIMITED TO THE MECHANICAL, PLUMBING, FIRE AND ENERGY CODES.
   – SMACNA PUBLICATIONS, INCLUDING BUT NOT LIMITED TO, HVAC DUCT CONSTRUCTION STANDARDS AND GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL SYSTEMS.
   – AABC OR NEBB REGULATIONS GOVERNING TESTING AND BALANCING AND COMMISSIONING OF SYSTEMS.
   – OSHA REGULATIONS.
5. PERMITS – OBTAIN ALL REQUIRED PERMITS AND PAY ALL FEES THEREFORE AND COMPLY WITH ALL LOCAL AND STATE REGULATIONS, CODES AND BY-LAWS APPLICABLE TO THE WORK.
6. RESPONSIBILITY – VISIT THE SITE BEFORE SUBMITING A BID AND EXAMINE ALL LOCAL AND EXISTING CONDITIONS ON WHICH THE WORK IS DEPENDENT.

   NO CONSIDERATION WILL BE GRANTED FOR ANY MISUNDERSTANDING OF WORK TO BE DONE RESULTING FROM FAILURE TO VISIT THE SITE.

   WHEN THE CONTRACT DOCUMENTS DO NOT CONTAIN SUFFICIENT INFORMATION FOR THE PROPER SELECTION OF EQUIPMENT FOR BIDDING, NOTIFY THE DESIGN AUTHORITY DURING THE BIDDING PERIOD. IF CLARIFICATION CANNOT BE OBTAINED, ALLOW FOR THE MOST EXPENSIVE ARRANGEMENT. FAILURE TO DO THIS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBLITY TO SUPPLY THE INTENDED EQUIPMENT AND OR INSTALLATION.

   CHECK DRAWINGS OF ALL TRADES AND SITE SURVEY TO VERIFY SPACE AVAILABILITY FOR THE INSTALLATION. COORDINATE WORK WITH ALL TRADES AND MAKE CHANGES TO FACILITATE SATISFACTORY INSTALLATION. MAKE NO DEVIATIONS TO THE DESIGN INTENT INVOLVING EXTRA COST TO THE OWNER WITHOUT DESIGN AUTHORITY WRITTEN APPROVAL.
7. WORKMANSHIP – WORKMANSHIP SHALL BE IN ACCORDANCE WITH WELL ESTABLISHED PRACTICE AND STANDARDS ACCEPTED AND RECOGNIZED BY DESIGN AUTHORITY AND THE TRADE.

   EMPLOY ONLY TRADESMEN HOLDING VALID TRADE QUALIFICATION CERTIFICATES. TRADESMEN SHALL PERFORM ONLY WORK THAT THEIR CERTIFICATE PERMITS.
8. DRAWING AND MEASUREMENTS – DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO INDICATE THE SCOPE AND GENERAL ARRANGEMENT OF WORK. DO NOT SCALE DRAWINGS.

   TAKE FIELD MEASUREMENTS WHERE EQUIPMENT AND MATERIAL DIMENSIONS ARE DEPENDENT UPON BUILDING DIMENSIONS.
9. SUBMITTALS – SUBMIT THREE SETS OF ALL EQUIPMENT AND RELATED MATERIAL FOR APPROVAL PRIOR TO ORDERING. AFTER 10 DAYS FROM CONTRACT AWARD, SUBMIT DUCT SHOP DRAWINGS TO ARCHITECT FOR ENGINEERS REVIEW.
10. RECORD DRAWINGS – MAINTAIN ONE CONTRACT DRAWING, WHITE PRINT, ON SITE, SOLELY FOR THE PURPOSE OF RECORDING, IN RED, ANY CHANGES AND/OR DEVIATION FROM THE CONTRACT DRAWINGS AS IT OCCURS.

AT THE COMPLETION OF THE PROJECT, CERTIFY THE ABOVE-MENTIONED DRAWINGS AS BEING ACCURATE AND COMPLETE BY LABELLING IN THE LOWER RIGHT HAND CORNER IN LETTERS OF AT LEAST ½ INCH HIGH AS FOLLOWS: "AS-BUILT DRAWINGS. DATED ---". DELIVER TO DESIGN AUTHORITY.

11. OPERATING AND MAINTENANCE MANUALS – PREPARE INSTRUCTION MANUALS WHICH INCLUDE EQUIPMENT MANUFACTURER'S OPERATING AND MAINTENANCE BULLETINS, AND A REPORT ON THE TESTING AND BALANCING. SUBMIT THREE (3) COPIES TO DESIGN AUTHORITY.
12. SERVICES – PROTECT ALL SERVICES AND MAKE GOOD ANY DAMAGE CAUSED BY THE WORK IN THIS CONTRACT.

    THE PLANS SHOW APPROXIMATE LOCATIONS OF DUCTWORK, PIPING AND EQUIPMENT BASED UPON EXISTING RECORD DRAWINGS. BE PREPARED TO ACCOMMODATE CHANGES IN LOCATION AS MAY BE FOUND ON SITE.
13. DUCTWORK CLEANING – ALL NEW DUCTWORK SHALL BE WIPED CLEAN OF ALL OIL AND OTHER SURFACE FILMS WITH SUITABLE SOLVENT PRIOR TO INSTALLATION.

ALL SUPPLY AND RETURN DUCTWORK SHALL BE THOROUGHLY CLEANED BY A PROFESSIONAL DUCT CLEANING AGENCY PRIOR TO REUSE.

14. CLEAN UP – MAKE GOOD AND CLEAN ALL AREAS DISRUPTED BY THIS WORK.
15. BALANCING – AIR SYSTEMS – BALANCING SHALL BE DONE BY AN AABC OR NEBB CERTIFIED FIRM. ADJUST AIR HANDLING EQUIPMENT AND ASSOCIATED BALANCE DAMPERS ON SUPPLY, RETURN AND EXHAUST SYSTEMS TO WITHIN PLUS OR MINUS 10% OF THE SPECIFIED AIR QUANTITIES. MAINTAIN THE DESIGN PRESSURE RELATIONSHIPS.

    ADJUST DIFFUSERS, REGISTERS AND GRILLES TO OBTAIN OPTIMUM AIR DISTRIBUTION PATTERN.

    MEASURE OUTSIDE AIR QUANTITIES AND CONFIRM THAT THE SPECIFIED OUTSIDE AIR QUANTITIES PER TITLE-24 CALCULATIONS HAVE BEEN PROVIDED THROUGHOUT.

    PERMANENTLY MARK THE FINAL BALANCE POSITION ON ALL BALANCE DAMPERS AND ADJUSTABLE TURNING DEVICES.

    SUBMIT A REPORT TO THE DESIGN AUTHORITY INDICATING FINAL AIR QUANTITIES OBTAINED.
16. EQUIPMENT START UP AND COMMISSIONING

    CHECK AND ADJUST REFRIGERANT CHARGE AS REQUIRED FOR PROPER OPERATION.

    BALANCE AC UNITS TO PROVIDE SPECIFIED AIR FLOWS.

    PROVIDE ALL AC UNITS WITH NEW MERV 13 FILTERS. FILTER.

    TO ASSURE THAT ALL FUNCTIONS AND PERFORMANCE ARE AS INDICATED ON THE MANUFACTURER'S RATING. ALL EQUIPMENT SHALL BE BALANCED AND TESTED TO PROVIDE THE OWNER WITH FUNCTIONING SYSTEMS. THE HVAC SYSTEMS SHALL HAVE A MINIMUM OF ONE YEAR WARRANTY ON ALL PARTS AND LABOR OR LONGER AS AGREED BETWEEN OWNER AND CONTRACTOR.

MECHANICAL LEGEND

SYMBOL	ABBREV	DESCRIPTION	ABBREV	DESCRIPTION
	POC	POINT OF CONNECTION	EQPT.	EQUIPMENT
	POD	POINT OF DISCONNECTION	KW	KILOWATT
		EXISTING EQUIPMENT OR PIPING TO REMAIN	LBS	POUNDS
		NEW EQUIPMENT OR PIPING	MAX	MAXIMUM
		REMOVE EXISTING EQUIPMENT OR PIPING	MECH	MECHANICAL
	FD	FLEX DUCT	MFR	MANUFACTURER
		SIDEWALL REGISTER	MIN	MINIMUM
		CEILING SUPPLY DIFFUSERS	MTD	MOUNTED
		CEILING EXHAUST DIFFUSERS		
		CEILING RETURN DIFFUSERS		
		DUCT SECTION – SUPPLY AIR	(N)	NEW
		DUCT SECTION – RETURN AIR	NOS	NUMBERS
		DUCT SECTION – EXHAUST AIR	OBD	OPPOSED BLADE DAMPER
		SUPPLY AIR DUCT DOWN		
		RETURN AIR DUCT DOWN		
		EXHAUST AIR DUCT DOWN		
		CARBON DIOXIDE (CO2) SENSOR/DETECTOR	OSA	OUTSIDE AIR
		ROOM THERMOSTAT/TEMPERATURE SENSOR	HP	HORSEPOWER
		DOOR UNDERCUT	HR	HOUR
		DUCT SMOKE DETECTOR	QTY	QUANTITY
	VD	VOLUME DAMPER	RA	RETURN AIR
	CD	CEILING DIFFUSER	RG	RETURN AIR GRILLE
	BTU	BRITISH THERMAL UNITS	RAD	RETURN AIR DUCT
	BTUH	BRITISH THERMAL UNITS PER HOUR	RR	RETURN AIR REGISTER
	CFM	CUBIC FEET PER MINUTE	SA	SUPPLY AIR
	DWGS	DRAWINGS	SAD	SUPPLY AIR DUCT
	DG	DOOR GRILLE	SR	SUPPLY AIR REGISTER
	SFD	COMBINATION SMOKE/FIRE DAMPER	SF	SQUARE FEET
	VD	VOLUME DAMPER WITH CONCEALED REGULATOR	FSD	SMOKE/FIRE DAMPER
		THERMOSTAT	SS	STAINLESS STEEL
	(E)	EXISTING	TEMP	TEMPERATURE
	EA	EACH	TYP	TYPICAL
	EAD	EXHAUST AIR DUCT	TA	TRANSFER AIR
	EAR	EXHAUST AIR REGISTER	T/A	TO ABOVE
	EF	EXHAUST FAN	T/B	TO BELOW
	HVAC	HEATING VENTILATION & AIR CONDITIONING	TR	TRANSFER REGISTER
	°F	DEGREES FAHRENHEIT	V/PH/HZ	VOLTS/PHASE/HERTZ
	F/A	FROM ABOVE	VCD	VARIABLE VOLUME CONTROL
	F/B	FROM BELOW	VOL	VOLUME
	FLR	FLOOR	VTR	VENT THRU ROOF
	FT	FEET OR FOOT	W/	WITH
	GALV	GALVANIZED	WC	WATER COLUMN
	GPM	GALLONS PER MINUTE	WPD	WATER PRESSURE DROP
	PSI	POUNDS PER SQUARE INCH	WT	WEIGHT
	PSIG	POUNDS PER SQUARE INCH GAUGE	MUA	MAKE UP AIR
-R-R-R-		REFRIGERANT LINE		

EQUIPMENT IDENTIFICATION SYMBOL



SCOPE OF WORK

1. PROVIDE HEATING, COOLING AND VENTILATION BY PROVIDING NEW PACKAGED ROOFTOP UNITS.

DRAWING INDEX

M0.1	SPECIFICATIONS, LEGENDS AND GENERAL NOTES
M0.2	MECHANICAL SCHEDULES AND DETAILS
M0.3	MECHANICAL T24 FORMS
M0.4	T24 ENVELOPE FORMS
M0.5	T24 ENVELOPE FORMS
M2.1	MECHANICAL FLOOR PLAN
M2.2	MECHANICAL ROOF PLAN

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MECHANICAL SPECIFICATIONS LEGEND AND GENERAL NOTES

NO.	DATE	DESCRIPTION
1	11/28/2023	PC COMMENTS

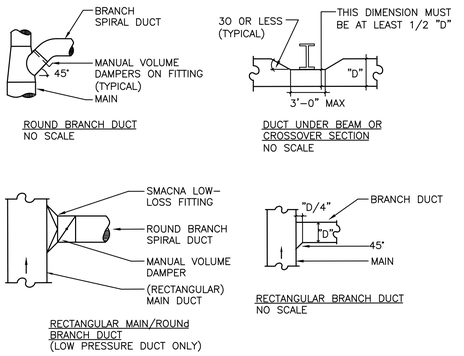
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M0.1

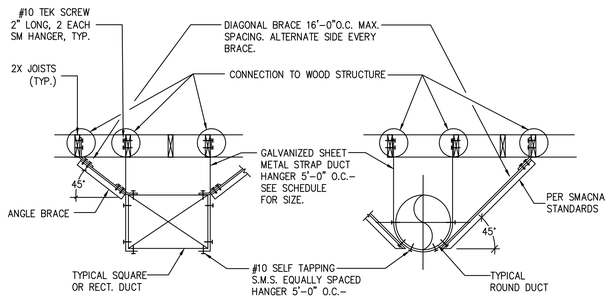
AC UNITS SCHEDULE

MARK	MANUFACTURER & MODEL	SERVICE	NOMINAL TONNAGE	CFM	ESP (IN)	MIN OA (CFM)	ELECTRICAL			IEER	EER	TOTAL COOLING CAPACITY (MBH)	TOTAL HEATING CAPACITY (MBH)	SOUND LEVEL (dB)	OPERATING WEIGHT (LBS)	REMARKS
							V / PH / HZ	MOCP	MCA							
AC 1	TRANE WHC102H3 OR APPROVED EQUAL	AS SHOWN	8.5	3400	1.0	330	208–230 / 3 / 60	60	46	15.5	12	105.9	93.0	85	1400	1, 2, 3, 4, 5, 6, 7, 8
AC 2	TRANE WHC102H3 OR APPROVED EQUAL	AS SHOWN	8.5	3400	1.0	330	208–230 / 3 / 60	60	46	15.5	12	105.9	93.0	85	1400	1, 2, 3, 4, 5, 6, 7, 8

1. PROVIDE WITH T24 APPROVED T'SATS.
2. PROVIDE WITH MERV 13 PLEATED FILTERS.
3. PROVIDE WITH POWER EXHAUST AND FIXED DRY BULB TEMP ECONOMIZER WITH FDD CONTROL.
4. PROVIDE WITH ROOF CURB.
5. PROVIDE WITH SMOKE DETECTOR ON SUPPLY SIDE.
6. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
7. UNIT FOR FUTURE TENANT'S USE.
8. UNIT WEIGHT ARE INCLUSIVE OF CURB AND ACCESSORIES.



1 | SCALE NONE | DUCT INSTALLATION DETAIL

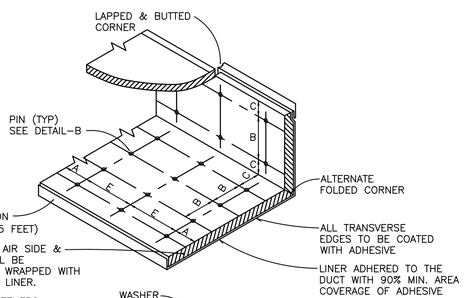


RETANGULAR DUCT			ROUND DUCT		
MAX. OF DUCT PERIMETER/IN.	STRAP	MAX. LOAD EACH HANGER/LBS.	DIAMETER /INCHES	STRAP	MAX. LOAD EACH HANGER/LBS.
P/2 =72	1"X 20 GA.	100	UP TO 20"	1"X 20 GA.	100
P/2 =96	1"X 18 GA.	150	21" TO 36"	1"X 18 GA.	150

2 | SCALE NONE | DUCT SUPPORT DETAIL

NO. PINS	LINER INTERIOR WIDTH
0	8" DN.
2	9"–16"
3	17"–28"
4	29"–40"
5	41"–52"
6	53"–64"
7	65"–76"
8	77"–88"
9	89"–100"

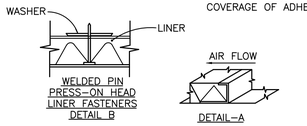
NOTE:
THE VELOCITY RATED SIDE OF LINER MUST FACE THE AIR FLOW



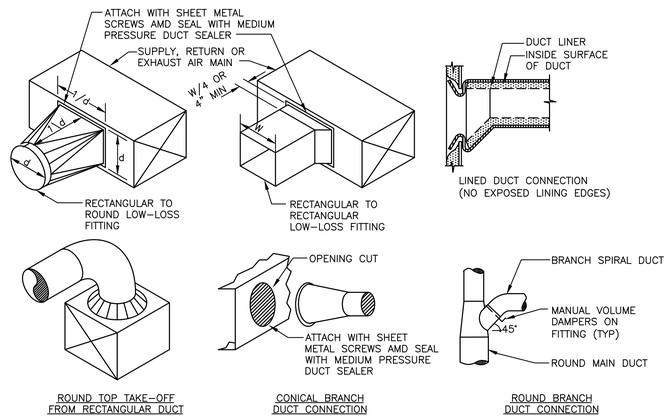
MAXIMUM SPACING FOR FASTENERS.
ACTUAL INTERVALS ARE APPROXIMATE.

VELOCITY *	DIMENSIONS			
	A	B	C	E
0–2500 FPM	3"	12"	4"	18"
2501–6000 FPM	3"	6"	4"	16"

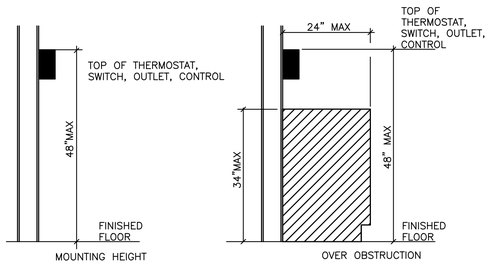
* UNLESS A LOWER LEVEL IS SET BY MANUFACTURER OR LISTING AGENCY



3 | SCALE NONE | DUCT LINING DETAIL

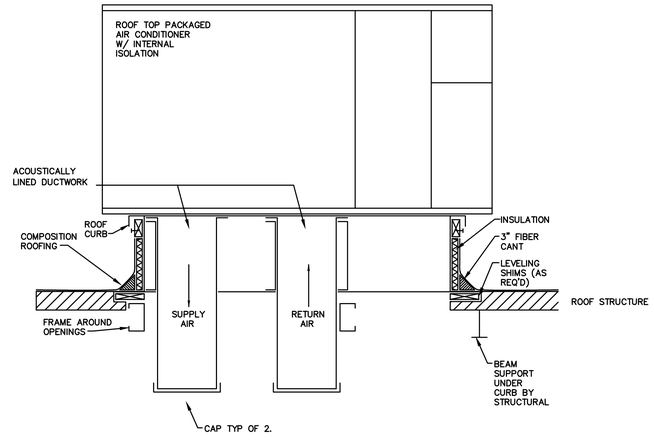


4 | SCALE NONE | BRANCH DUCTWORK CONNECTIONS



NOTE:
DETAIL APPLIES TO ALL SWITCHES AND SENSORS.

5 | SCALE NONE | THERMOSTAT MOUNTING DETAIL



6 | SCALE NONE | AC MOUNTING DETAIL

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MECHANICAL SCHEDULES AND DETAILS

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M0.2

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, or 141.0(b)2 for alterations.

A. GENERAL INFORMATION

01	Project Location (city)	REDWOOD CITY	04	Total Conditioned Floor Area	2630
02	Climate Zone	3	05	Total Unconditioned Floor Area	0
03	Occupancy Types Within Project:		06	# of Stories (Habitable Above Grade)	1

● Retail

B. PROJECT SCOPE

This table includes mechanical systems or components that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.4, 170.2(b) or 141.0(b)2 and 180.2(b)2 for alterations.

01	02	03
Air System(s)	Wet System Components	Dry System Components
☒ Heating Air System	☐ Water Economizer	☐ Air Economizer
☒ Cooling Air System	☐ Pumps	☐ Electric Resistance Heat
Mechanical Controls	☐ System Piping	☐ Fan Systems
☐ Mechanical Controls (existing to remain, altered or new)	☐ Cooling Towers	☐ Ductwork (existing to remain, altered or new)
	☐ Chillers	☒ Ventilation
	☐ Boilers	☐ Zonal Systems/ Terminal Boxes

C. COMPLIANCE RESULTS

Table C will indicate if the project data input into the compliance document is compliant with mechanical requirements. This table is not editable by the user. If this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D., or the table indicated as not compliant for guidance.

01		02		03		04		05		06		07		08	09
System Summary 110.1, 110.2, 140.4, 170.2(c)	AND	Pumps 140.4(k), 170.2(c)4I	AND	Fans/ Economizers 140.4(c), 140.4(e), 170.2(c)	AND	System Controls 110.2, 120.2, 140.4(f), 170.2(c)	AND	Ventilation 120.1, 160.2	AND	Terminal Box Controls 140.4(d), 170.2(c)4B	AND	Distribution 120.3, 140.4(l), 160.2, 160.3	AND	Cooling Towers 110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
Yes	AND		AND		AND	Yes	AND	Yes	AND		AND		AND		COMPLIES
Mandatory Measures Compliance (See Table Q for Details)															COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Space Conditioning System Information

01	02	03	04	05	06
System Name	Quantity	System Serving	System Status	Space Type	Utilizing Recovered Heat
AC-1	1	Single zone	New/ Addition	Retail	☐
AC-2	1	Single zone	New/ Addition	Retail	☐

F. HVAC SYSTEM SUMMARY (DRY & WET SYSTEMS)

Dry System Equipment Sizing (Includes air conditioners, condensers, heat pumps, VRF, furnaces and unit heaters and DOAS systems)

01	02	03	04	05	06	07	08	09	10	11
				Equipment Sizing per Mechanical Schedule (kBtu/h) 140.4(a&b), 170.2(c)1 & 170.2(c)2						
				Heating Output[2,3]			Cooling Output[2,3]		Load Calculations[3,4]	
Name or Item Tag	Equipment Category per Tables 110.2, 140.4(a)2 and 170.2(c)3aii	Equipment Type per Tables 110.2 and Title 20	Smallest Size Available[1] 140.4(a) and 170.2(c)1	Per Design (kBtu/h)	Rated (kBtu/h)	Supp. Heating Output (kBtu/h)	Sensible Per Design (kBtu/h)	Rated (kBtu/h)	Total Heating Load (kBtu/h)	Total Sensible Cooling Load (kBtu/h)
AC-1	Unitary Heat Pumps	Air-cooled, pkg (3 phase)	Yes	93	93	0	74,130	105.9	24.8	31.8
AC-2	Unitary Heat Pumps	Air-cooled, pkg (3 phase)	Yes	93	93	0	74,130	105.9	24.8	31.8

[1]*FOOTNOTES: Equipment shall be the smallest size, within the available options of the desired equipment line, necessary to meet the design heating and cooling loads of the building per 140.4(a) and 170.2(c)1. Healthcare facilities are excepted.*
[2]*It is common practice to show rated output capacity on the equipment schedule. Sensible cooling output comes from specification sheet tables.*
[3] *If equipment is heating only, leave cooling output and load blank. If equipment is cooling only, leave heating output and load blank.*
[4] *Authority Having Jurisdiction may ask for load calculations used for compliance per 140.4(b) and 170.2(c).*

Dry System Equipment Efficiency (other than Package Terminal Air Conditioners (PTAC) and Package Terminal Heat Pumps (PTHP), DX-DOAS and Dual Fuel Heat Pumps)

01	02	03	04	05	06	07	08	09
		Heating Mode				Cooling Mode		
Name or Item Tag	Size Category (Btu/h)	Rating Condition (°F)	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency	Efficiency Unit	Minimum Efficiency Required per Tables 110.2 / Title 20	Design Efficiency
AC-1	>=65,000 and <135,000	47 °Fdb/ 43 °Fwb OSA	COP	3.4	3.4	EER IEER	11 14.1	12 15.5
AC-2	>=65,000 and <135,000	47 °Fdb/ 43 °Fwb OSA	COP	3.4	3.4	EER IEER	11 14.1	12 15.5

G. PUMPS

This section does not apply to this project.

H. FAN SYSTEMS & AIR ECONOMIZERS

This section does not apply to this project.

I. SYSTEM CONTROLS

This table is used to demonstrate compliance with mandatory controls in 110.2 and 120.2 and prescriptive controls in 140.4(f) and (n), 170.2(c)4D 170.2(c)4L or requirements in 141.0(b)2E 180.2(b)2 for altered space conditioning systems.

01	02	03	04	05	06	07	08	09
System Name	System Zoning	Conditioned Floor Area Being Served (ft²)	Thermostats 110.2(b) & (c)[1], 120.2(a) 160.3(a)2A or 141.0(b)2E & 180.2(b)2	Shut-Off Controls 120.2(e) & 160.3(a)2D	Isolation Zone Controls 120.2(g) & 160.3(a)2F	Demand Response 110.12 120.2(b) & 160.3(a)2B	Supply Air Temp. Reset 140.4(f) & 170.2(c)4D	Window Interlocks per 140.4(n) & 170.2(c)4D
AC-1	Single zone	<= 25,000 ft²	EMCS	Auto Timer Switch	Auto Timer Switch	EMCS	Included	NA: No operable windows
AC-2	Single zone	<= 25,000 ft²	Setback	Auto Timer Switch	Auto Timer Switch	EMCS	Included	NA: No operable windows

[1]*FOOTNOTES: Gravity gas wall heaters, gravity floor heaters, gravity room heaters, non-central electric heaters, fireplaces or decorative gas appliances, wood stoves are not required to have setback thermostats.*

J. VENTILATION AND INDOOR AIR QUALITY

This table is used to demonstrate compliance with mandatory ventilation requirements in 120.1 120.2(e)3B 140.4(p) and 140.4(a) for all nonresidential and hotel/motel and dt12#refnolink/}160.2, 160.3(a)3J), 170.2(a)4N, 170.2(a)4O for high-rise residential occupancies. For alterations, only ventilation systems being altered within the scope of the permit application need to be documented in this table. In lieu of this table, the required outdoor ventilation rates and airflows may be shown on the plans or the calculations can be presented in a spreadsheet.

01	☐	Check the box if the project is showing ventilation calculations on the plans, or attaching the calculations instead of completing this table.
02	☒	Check this box if the project included Nonresidential, Hotel/Motel Spaces or Multifamily Common Use Spaces
03	☐	Check the box if the project is using natural ventilation in any nonresidential or hotel/motel spaces to meet required ventilation rates per 120.1(c)2.

Nonresidential and Hotel/ Motel Multifamily Common Use Ventilation Systems

04	05			06		07
System Name	AC-1	System Design OA CFM Airflow[1]	330	System Design Transfer Air CFM	0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]
						Provided
08	09	10	11	12	13	14	15	16
Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)3[3] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4			DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3[5] 160.2(c)5D 160.2(c)5E 160.2(c)5D
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM	
RETAIL SPACE 1/2	Retail sales	1315			328.75			DCV: NA: Not required per §120.1(d)3
								Occ Sensor: NA: Not required space type
17	Total System Required Min OA CFM				328.75	18	Ventilation for this System Complies?	Yes

04	05			06		07
System Name	AC-2	System Design OA CFM Airflow[1]	330	System Design Transfer Air CFM	0	Air Filtration per 120.1(c) 141.0(b)2 and 160.2(c)21[2]
						Provided
08	09	10	11	12	13	14	15	16

J. VENTILATION AND INDOOR AIR QUALITY

Space Name or Item Tag	Mechanical Ventilation Required per 120.1(c)3[1] & 160.2(c)3				Exh. Vent per 120.1(c)4 & 160.2(c)4		DCV or Sensor Controls per 120.1(d)3, 120.1(d)5, and 120.1(e)3[5] 160.2(c)5D 160.2(c)5E 160.2(c)5D
	Occupancy Type[4]	Conditioned Floor Area (ft²)	# of Shower heads/ toilets	# of people[5]	Required Min OA CFM	Required Min CFM	Provided per Design CFM	
RETAIL 2/2	Retail sales	1315			328.75			DCV: NA: Not required per §120.1(d)3
								Occ Sensor: NA: Not required space type
17	Total System Required Min OA CFM				328.75	18	Ventilation for this System Complies?	Yes

[1] *FOOTNOTES: System CFM should include both mechanical and natural ventilation for the zone/system*
[2] *Air filtration requirements apply to the following three system types per 120.1(c)1A: space conditioning systems utilizing ducts to supply air to occupiable space; supply-only ventilation systems providing outside air to occupiable space; supply side of balanced ventilation systems including heat recovery and energy recovery ventilation systems providing outside air to occupiable space.*
[3] *Uniform Mechanical Code may have more stringent ventilation requirements; the most stringent code requirement takes precedence.*
[4] *See Standards Tables 120.1-A and 120.1-B.*
[5] *For lecture halls with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code.*
[6] *120.2(e)3 requires systems serving rooms that are required by 130.1(c) to have lighting occupancy sensing controls to also have occupancy sensing zone controls for ventilation. Examples of spaces which require lighting occupancy sensors include offices 250ft² or smaller, multipurpose rooms less than 1,000 ft², classrooms, conference rooms, restrooms, aisles and open areas in warehouses, library book stack aisles, corridors, stairwells, parking garages, and loading and unloading zones, unless excepted by 130.1(c).*

K. TERMINAL BOX CONTROLS

This section does not apply to this project.

L. DISTRIBUTION (DUCTWORK and PIPING)

This section does not apply to this project.

M. COOLING TOWERS

This section does not apply to this project.

N. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCI/

Form/Title
NRCI-MCH-01-E - Must be submitted for all buildings

O. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections have been made based on information provided in previous tables of this document. If any selection needs to be changed, please explain why in Table E Additional Remarks. These documents must be provided to the building inspector during construction and can be found online at https://www.energy.ca.gov/title24/2019standards/2019_compliance_documents/Nonresidential_Documents/NRCA/

Form/Title	Systems/Spaces To Be Field Verified
NRCA-MCH-02-A - Outdoor Air must be submitted for all newly installed HVAC units. Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.	AC-1; AC-2
NRCA-MCH-16-A Supply Air Temperature Reset Controls	AC-1; AC-2
NRCA-MCH-18-A Energy Management Control Systems	AC-1; AC-2

P. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

There are no NRCV forms required for this project.

Q. MANDATORY MEASURES DOCUMENTATION LOCATION

This table is used to indicate where mandatory measures are documented in the plan set or construction documentation.

01		02
Compliance with Mandatory Measures documented through MCH Mandatory Measures Note Block	No	Plan sheet or construction document location
03		04
Mandatory Measure		**Plan sheet or construction document location**
Heating Equipment Efficiency per 110.1		M0.2
Cooling Equipment Efficiency per 110.1		M0.2
Furnace Standby Loss Control per 110.2(d)		N/A
Heat Pump with Supplemental electric Resistance Heater Controls per 110.2(b)		M0.2
Kitchen range hoods shall be rated for sound in accordance with Section 7.2 of ASHRAE 62.2		N/A

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: RAMIL BATIANCILA	Documentation Author Signature: Ramil Batiancila
Company: MR ENGINEERING CONSULTANTS, INC.	Signature Date: JULY 7, 2023
Address: 39210 STATE ST. STE 106	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: FREMONT, CA 94538	Phone: 510-449-4862

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	LEVI MALABUYO	Responsible Designer Signature:	
Company:	MR ENGINEERING CONSULTANTS INC.	Date Signed:	JULY 7, 2023
Address:	39210 STATE ST. STE 106	License:	M26141
City/State/Zip:	FREMONT, CA 94538	Phone:	510-449-4862

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SHEET TITLE

MECHANICAL
T24 FORMS

NO.	DATE	DESCRIPTION
1	11/28/2023	PC COMMENTS

PROJECT #: A2306-AD441
DRAWN: CHECKED:
SCALE: AS SHOWN DATE: 11.28.2023
SHEET

M0.3

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 1 of 13)**

Project Name: **PROPOSED RETAIL BUILDING** | **Date Prepared:** **2023-06-29**

A. General Information

1	Project Name	PROPOSED RETAIL BUILDING			
2	Run Title	Title 24 Analysis			
3	Project Location	2219 EL CAMINO REAL			
4	City	REDWOOD CITY	5	Standards Version	Compliance 2022
6	Zip code	94063	7	Compliance Software (version)	EnergyPro 9.1
8	Climate Zone	3	9	Building Orientation (deg)	0
10	Building Type(s)	• Nonresidential	11	Weather File	SAN-FRANCISCO-INTL_STYP20.epw
12	Project Scope	• New envelope	13	Number of Dwelling Units	0
14	Total Conditioned Floor Area in Scope (ft^2)	2630	15	Total # of hotel/motel rooms	0
16	Total Unconditioned Floor Area (ft^2)	0	17	Fuel Type	Natural gas
18	Nonresidential Conditioned Floor Area	2630	19	Total # of Stories (Habitable Above Grade)	1
20	Residential Conditioned Floor Area	0			

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 2 of 13)**

B. PROJECT SUMMARY

Table B shows which building components are included in the performance calculation. If indicated as not included, the project must show compliance prescriptively if within the permit application.

Building Components Complying via Performance						Building Components Complying Prescriptively	
Envelope (See Table G)	Nonres	Performance	Solar Thermal Water Heating (See Table I3)	☐	Performance	The following building components are ONLY eligible for prescriptive compliance and should be documented on the NRCC form listed if within the scope of the permit application (i.e. compliance will not be shown on the NRCC-PRF-E).	
	MultiFam	Not Included		☒	Not Included		
Mechanical (See Table H)	Nonres	Not Included	Covered Process: Commercial Kitchens (see Table J)	☐	Performance	Indoor Lighting (Unconditioned) 140.6 & 170.2(e)	NRCC-LTI-E is required
	MultiFam	Not Included		☒	Not Included	Outdoor Lighting 140.7 & 170.2(e)	NRCC-LTO-E is required
Domestic Hot Water (See Table I)	Nonres	Not Included	Covered Process: Laboratory Exhaust (see Table J)	☐	Performance	Sign Lighting 140.8 & 170.2(e)	NRCC-LTS-E is required
	MultiFam	Not Included		☒	Not Included	**Building Components Complying with Mandatory Measures**	
Lighting (Indoor Conditioned, see Table K)	Nonres	Not Included	Photovoltaics (see Table F)	☐	Performance	Electrical power systems, commissioning, solar ready, elevator and escalator requirements are mandatory and should be documented on the NRCC form listed if applicable (i.e. compliance will not be shown on the NRCC-PRF-E.)	
	MultiFam	Not Included		☒	Not Included	Electrical Power Distribution 110.11	NRCC-ELC-E is required
			Battery (see Table F)	☐	Performance	Commissioning 120.8	NRCC-CXR-E is required
				☒	Not Included	Solar and Battery 110.10	NRCC-SAB-E is required

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 3 of 13)**

C1. COMPLIANCE SUMMARY

	COMPLIES[3]		
	Time Dependent Valuaton (TDV)		Source Energy Use
	Efficiency[1] (kBtu/ft^2 - yr)	Total[2] (kBtu/ft^2 - yr)	Total[2] (kBtu/ft^2 - yr)
Standard Design	218.33	218.33	16.7
Proposed Design	218.07	218.07	16.66
Compliance Margins	**0.26**	**0.26**	**0.04**
	Pass	**Pass**	**Pass**

[1] Efficiency measures include improvements like a better building envelope and more efficient equipment
[2] Compliance Totals include efficiency, photovoltaics and batteries
[3] Building complies when efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 4 of 13)**

C2. TDV ENERGY COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kBtu/ft^2 - yr)

	COMPLIES[2]		
Energy Component	**Standard Design (TDV)**	**Proposed Design (TDV)**	**Compliance Margin (TDV)[1]**
Space Heating	9.26	9.82	-0.56
Space Cooling	20.61	20.86	-0.25
Indoor Fans	100.96	99.89	1.07
Heat Rejection	0	0	0
Pumps & Misc.	0	0	0
Domestic Hot Water	0	0	0
Indoor Lighting	87.5	87.5	0
Flexibility	---	---	---
EFFICIENCY COMPLIANCE TOTAL	**218.33**	**218.07**	**0.26 (0.1%)**
Photovoltaics	---	---	---
Batteries	---	---	---
TOTAL COMPLIANCE	**218.33**	**218.07**	**0.26 (0.1%)**

[1] Notes: This number in parenthesis following the Compliance Margin in column 4, represents the Percent Better than Standard.

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 5 of 13)**

C3. TDV ENERGY RESULTS FOR NON-REGULATED COMPONENTS[1]

Non-Regulated Energy Component	Standard Design (TDV)	Proposed Design (TDV)	Compliance Margin (TDV)[1]
Receptacle	91.83	91.83	---
Process	1108.45	1108.45	---
Other Ltg	---	---	---
Process Motors	---	---	---
TOTAL (TOTAL COMPLIANCE + NON-REGULATED COMPONENTS)	**1418.61**	**1418.35**	**0.26 (0%)**

[1] Notes: This table is not used for Energy Code Compliance.

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 6 of 13)**

C4. SOURCE ENERGY COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual SOURCE Energy Use, kBtu/ft^2 /yr)

	COMPLIES[2]		
Energy Component	**Standard Design (SOURCE)**	**Proposed Design (SOURCE)**	**Compliance Margin (SOURCE)[1]**
Space Heating	1.26	1.31	-0.05
Space Cooling	0.4	0.39	0.01
Indoor Fans	8.43	8.35	0.08
Heat Rejection	0	0	0
Pumps & Misc.	0	0	0
Domestic Hot Water	0	0	0
Indoor Lighting	6.61	6.61	0
Flexibility	---	---	---
EFFICIENCY COMPLIANCE TOTAL	**16.7**	**16.66**	**0.04 (0.2%)**
Photovoltaics	---	---	---
Batteries	---	---	---
TOTAL COMPLIANCE	**16.7**	**16.66**	**0.04 (0.2%)**

[1] Notes: This number in parenthesis following the Compliance Margin in column 4, represents the Percent Better than Standard.

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 7 of 13)**

C5. SOURCE ENERGY RESULTS FOR NON-REGULATED COMPONENTS[1]

Non-Regulated Energy Component	Standard Design (SOURCE)	Proposed Design (SOURCE)	Compliance Margin (SOURCE)[1]
Receptacle	6.9	6.9	---
Process	121.46	121.46	---
Other Ltg	---	---	---
Process Motors	---	---	---
TOTAL (TOTAL COMPLIANCE + NON-REGULATED COMPONENTS)	**145.06**	**145.02**	**0.04 (0%)**

[1] Notes: This table is not used for Energy Code Compliance.

C6. 'ABOVE CODE' QUALIFICATIONS

☐ This project is pursuing CalGreen Tier 1 ☐ This project is pursuing CalGreen Tier 2

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 8 of 13)**

C7. ENERGY USE SUMMARY

Energy Component	Standard Design Site (MWh)	Proposed Design Site (MWh)	Margin (MWh)	Standard Design Site (MBtu)	Proposed Design Site (MBtu)	Margin (MBtu)
Space Heating	0.8	0.8	0	---	---	---
Space Cooling	0.9	0.8	0.1	---	---	---
Indoor Fans	9.9	9.8	0.1	---	---	---
Heat Rejection	---	---	---	---	---	---
Pumps & Misc.	---	---	---	---	---	---
Domestic Hot Water	---	---	---	---	---	---
Indoor Lighting	9.1	9.1	0	---	---	---
Flexibility	---	---	---	---	---	---
EFFICIENCY TOTAL	**20.7**	**20.5**	**0.2**	**0**	**0**	**0**
Photovoltaics	---	---	---	---	---	---
Batteries	---	---	---	---	---	---
ENERGY USE SUBTOTAL	**20.7**	**20.5**	**0.2**	**0**	**0**	**0**
Receptacle	9.6	9.6	0	---	---	---
Process	103.7	103.7	0	---	---	---
Other Ltg	---	---	---	---	---	---
Process Motors	---	---	---	---	---	---
ENERGY USE TOTAL	**134**	**133.8**	**0.2**	**0**	**0**	**0**

CERTIFICATE OF COMPLIANCE - NONRESIDENTIAL PERFORMANCE COMPLIANCE METHOD — **NRCC-PRF-E**

Nonresidential Performance Compliance Method — **(Page 9 of 13)**

C8. ENERGY USE INTENSITY (EUI)

	Standard Design (kBtu/ft^2 / yr)	Proposed Design (kBtu/ft^2 / yr)	Margin (kBtu/ft^2 / yr)	Margin Percentage
GROSS EUI[1]	173.84	173.58	0.26	0.15
NET EUI[1]	173.84	173.58	0.26	0.15

[1] Notes: Gross EUI is Energy Use Total (not including PV)/Total Building Area. Net EUI is Energy Use Total (including PV)/Total Building Area.

D1. EXCEPTIONAL CONDITIONS

• This project includes partial performance compliance scope options. The building must show compliance with all other applicable compliance scope options (performance or prescriptively) before occupying.
• The project uses the Simplified Geometry Performance Modeling Approach which is not capable of modeling daylighting controls and assumes the prescriptive Secondary Daylit Control requirements are met. PRESCRIPTIVE COMPLIANCE documentation (form NRCC-LTI-02-E) for the requirements of section 140.6(d) Automatic Daylighting Controls in Secondary Daylit Zones is required.
• The building does not include service water heating. Verify that service water heating is not required and is not included in the design.
• The proposed building includes space(s) that are modeled with unknown HVAC system(s). Verify that the spaces modeled with unknown HVAC system(s) are either part of core and shell analysis which will be permitted for mechanical compliance in the future, or the spaces have an existing HVAC system not modeled for compliance, or the compliance scope does not include mechanical.
• PV/Battery Building Type has been modified from software defaults for one or more spaces. Review project's PV/Battery Building Type(s) with documentation author. Refer to Energy Code section 140.10 for Nonresidential or 170.2(g) for more information.

G1. ENVELOPE GENERAL INFORMATION (conditioned spaces only)

01	02	03	04
Opaque Surfaces & Orientation	**Total Gross Surface Area (ft^2)**	**Total Fenestration Area (ft^2)**	**Window to Wall Ratio (%)**
North-Facing[1]	628	92	14.65

Notes
[1]North-Facing is oriented to within 45 degrees of true north, including 45 00'00" east of north (NE), but excluding 45 00'00" west of north (NW),
[2]East-Facing is oriented to within 45 degrees of true east, including 45 00'00" south of east (SE), but excluding 45 00'00" north of east (NE),
[3]South-Facing is oriented to within 45 degrees of true south, including 45 00'00" west of south (SW), but excluding 45 00'00" east of south (SE),
[4]West-Facing is oriented to within 45 degrees of true west, including 45 00'00" north of west (NW), but excluding 45 00'00" south of west (SW),

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SHEET TITLE

T24 ENVELOPE FORMS

NO.	DATE	DESCRIPTION
1	11/28/2023	PC COMMENTS

PROJECT #: A2306-AD441
DRAWN: CHECKED:
SCALE: AS SHOWN DATE: 11.28.2023

SHEET

M0.4

G1. ENVELOPE GENERAL INFORMATION (conditioned spaces only)

01	02	03	04
Opaque Surfaces & Orientation	**Total Gross Surface Area (ft²)**	**Total Fenestration Area (ft²)**	**Window to Wall Ratio (%)**
East-Facing[2]	845	137	16.21
South-Facing[3]	704	234	33.24
West-Facing[4]	767	110	14.34
Total	**2944**	**573**	**19.46**
Roof	2630	0	0

Notes
[1]*North-Facing is oriented to within 45 degrees of true north, including 45 00'00" east of north (NE), but excluding 45 00'00" west of north (NW),*
[2]*East-Facing is oriented to within 45 degrees of true east, including 45 00'00" south of east (SE), but excluding 45 00'00" north of east (NE),*
[3]*South-Facing is oriented to within 45 degrees of true south, including 45 00'00" west of south (SW), but excluding 45 00'00" east of south (SE),*
[4]*West-Facing is oriented to within 45 degrees of true west, including 45 00'00" north of west (NW), but excluding 45 00'00" south of west (SW),*

G4. NONRESIDENTIAL AIR BARRIER

01	02
Building Story Name	**Air Barrier**
Com-Floor 1	No air barrier

G5. OPAQUE SURFACE ASSEMBLY SUMMARY

01	02	03	04	05	06		07	08	09	10
Surface Name	**Construction Type**	**Area (ft²)**	**Framing Type**	**Cavity R-Value**	**Continuous R-Value**		**Units**	**Value**	**Description of Assembly Layers**	**Status[1]**
					Interior	**Exterior**				
Slab On Grade6	Underground Floor	2,630	N/A	0	N/A	N/A	F-factor	0.73	Slab Type =Unheated slab on grade Insulation Orientation =None Insulation R-Value =none	N
R40 Roof No Attic8	Roof	2,630	Wood	40	N/A	12.55	U-factor	0.02	Compliance Insulation R12.55 Vapor permeable felt - 1/8 in. Plywood - 1/2 in. Air - Cavity - Wall Roof Ceiling - 4 in. or more Composite-1 Gypsum Board - 1/2 in.	N
R-25 Wall10	Exterior Wall	2,944	Wood	25	N/A	N/A	U-factor	0.0608	Gypsum plaster - on metal lath 70 lb/ft3 - 3/4 in. Gypsum Board - 1/2 in. Vapor permeable felt - 1/8 in. Composite-2 Gypsum Board - 1/2 in.	N

[1] *Status: N - New, A - Altered, E - Existing*

G6A. OPAQUE DOOR SUMMARY (NONRESIDENTIAL)

01	02	03	04
Assembly Name	**Area (ft²)**	**Overall U-factor**	**Status[1]**
Metal Door14	21	0.7	N

[1] *Status: N - New, A - Altered, E - Existing*

G7A. FENESTRATION ASSEMBLY SUMMARY (NONRESIDENTIAL)

01	02	03	04	05	06	07	08	09
Fenestration Assembly Name	**Fenestration Type/ Product Type / Frame Type**	**Certification Method[1]**	**Assembly Method**	**Area (ft²)**	**Overall U-factor**	**Overall SHGC**	**Overall VT**	**Status[2]**
Residential Cooling	Vertical fenestration Fixed window N/A	NFRC	Manufactured	573	0.3	0.23	0.5	N

[1] *Notes: Newly installed fenestration shall have a certified NFRC Label Certificate or use the CEC default tables found in Table 110.6-A and Table 110.6-B. Center of Glass (COG) values are for the glass-only, determined by the manufacturer, and are shown for ease of verification. Site-built fenestration values are calculated per Nonresidential Appendix NA6 and are used in the analysis.*
[2] *Status: N - New, A - Altered, E - Existing*

I. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections made by Documentation Author indicate which Certificates of Installation must be submitted for the features to be recognized for compliance. These documents must be retained and provided to the building inspector during construction and can be found online

Building Component	Form/Title
Envelope	NRCI-ENV-01-E - Must be submitted for all buildings
Envelope	NRCI-ENV-E - Envelope (for all buildings)

M. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

Selections made by Documentation Author indicate which Certificates of Acceptance must be submitted for the features to be recognized for compliance. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP).

Building Component	Form/Title
Envelope	NRCA-ENV-02-F - NRFC label verification for fenestration

N. DECLARATION OF REQUIRED CERTIFICATES OF VERIFICATION

Selections made by Documentation Author indicate which Certificates of Verification must be submitted for the features to be recognized for compliance. These documents must be retained and provided to the building inspector during construction and can be found online

There are no Certificates of Verification applicable to this project

Documentation Author's Declaration Statement

I. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Ramil Batiancila	Documentation Author Signature: Ramil Batiancila
Company: MR Engineering Consultants, Inc	Signature Date: July 5, 2023
Address: 39210 State., St, Ste. 106	CEA/HERS Certification Identification (if applicable):
City/State/Zip: , Fremont, CA 94538	Phone: 510-449-4862

Responsible Person's Declaration statement

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I understand that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections, and I will take the necessary steps to accomplish this requirement.
6. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy, and I will take the necessary steps to accomplish these requirements.

Responsible Designer Name: MUTHANA IBRAHIM	Responsible Designer Signature:	
Company: M I ARCHITECTS, INC.		
Address: 2221 OLYMPIC BLVD, STE 100	Date Signed: 07-05-23	
City/State/Zip: , Walnut Creek CA 94595	License #: C29627	
Phone: 925 287-1174 X 1	Title: ARCHITECT	Scope: ENVELOP.

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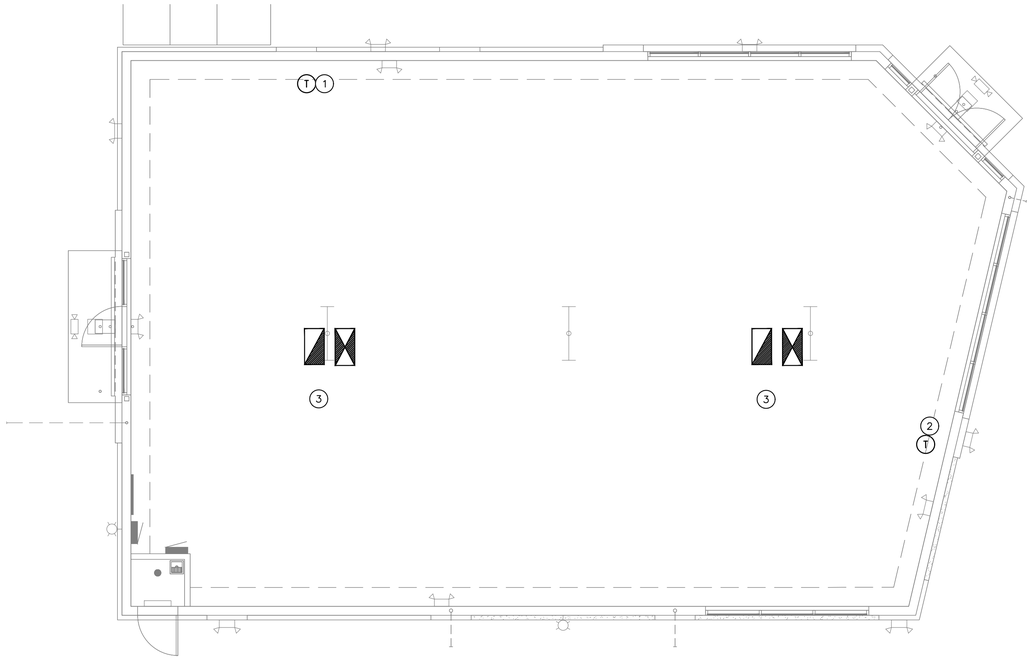
T24 ENVELOPE FORMS

NO.	DATE	DESCRIPTION
1	11/28/2023	PC COMMENTS

PROJECT #: A2306-AD441
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SHEET

M0.5



1 M2.1 MECHANICAL FLOOR PLAN

SCALE: 3/16"=1'-0"

GENERAL NOTES

A. CONTRACTOR SHALL VERIFY IN THE FIELD FOR EXACT LOCATION OF ALL DUCTING/PIPING AND UTILITIES PRIOR TO START OF WORK. IN THE EVENT OF ANY DISCREPANCIES OR POTENTIAL CONFLICTS, NOTIFY THE ARCHITECT AND ENGINEER IN WRITING PRIOR TO START OF WORK.

B. ALL DUCTING/PIPING LOCATIONS ARE DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND OWNER'S REPRESENTATIVE AND VERIFY EXACT ROUTING PRIOR TO START OF WORK.

C. FINAL THERMOSTAT/REMOTE SENSOR SHALL BE COORDINATED WITH THE ARCHITECT AND GENERAL CONTRACTOR FOR APPROVAL PRIOR TO INSTALLATION.

D. CONTRACTOR SHALL PERFORM AIR BALANCING AS PART OF TESTING AND COMMISSIONING ACTIVITIES OF ALL HVAC SYSTEM AND EQUIPMENT.

KEY NOTES

1. AC-1 THERMOSTAT. COORDINATE WITH ARCHITECT. REFER TO DETAIL #5/M0.2 FOR MOUNTING.
2. AC-2 THERMOSTAT. COORDINATE WITH ARCHITECT. REFER TO DETAIL #5/M0.2 FOR MOUNTING.
3. 17-1/2" X 33" SUPPLY AIR RISER AND 17-1/2" X 32-1/8" RETURN AIR RISER F/A. CAP OPEN DUCT ENDS.

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MECHANICAL FLOOR PLAN

NO.	DATE	DESCRIPTION
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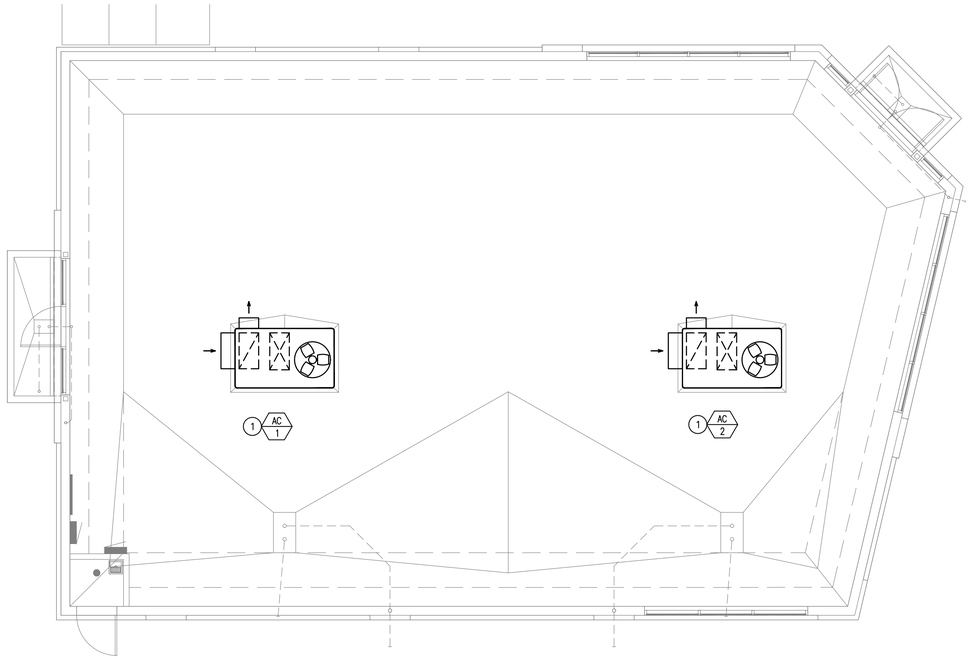
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DRAWN: CHECKED:

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SHEET

M2.1



1 M2.2 MECHANICAL ROOF PLAN

SCALE: 3/16"=1'-0"

GENERAL NOTES

A. CONTRACTOR SHALL VERIFY IN THE FIELD FOR EXACT LOCATION OF ALL DUCTING/PIPING AND UTILITIES PRIOR TO START OF WORK. IN THE EVENT OF ANY DISCREPANCIES OR POTENTIAL CONFLICTS, NOTIFY THE ARCHITECT AND ENGINEER IN WRITING PRIOR TO START OF WORK.

B. ALL DUCTING/PIPING LOCATIONS ARE DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND OWNER'S REPRESENTATIVE AND VERIFY EXACT ROUTING PRIOR TO START OF WORK.

C. FINAL THERMOSTAT/REMOTE SENSOR SHALL BE COORDINATED WITH THE ARCHITECT AND GENERAL CONTRACTOR FOR APPROVAL PRIOR TO INSTALLATION.

D. CONTRACTOR SHALL PERFORM AIR BALANCING AS PART OF TESTING AND COMMISSIONING ACTIVITIES OF ALL HVAC SYSTEM AND EQUIPMENT.

KEY NOTES

(1) NEW PACKAGED ROOFTOP UNIT. SEE M0.2 FOR EQUIPMENT SPECIFICATION.

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SHEET TITLE

MECHANICAL
ROOF PLAN

NO.	DATE	DESCRIPTION
1	11/28/2023	PC COMMENTS

PROJECT #: A2306-AD441
DRAWN: CHECKED:
SCALE: AS SHOWN DATE: 11.28.2023

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M2.2

PLUMBING GENERAL NOTES

1. THE ARCHITECTURAL DESIGN DRAWINGS SHALL INDICATE THE EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL PLUMBING FIXTURES.

2. THE ARCHITECTURAL DESIGN DRAWINGS SHALL INDICATE ALL ACCESSIBLE FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

3. HOT WATER SUPPLY AND DRAIN PIPING AT LAVATORIES AND SINKS SHALL BE INSULATED OR OTHERWISE COVERED. ALL WATER CLOSET FLUSHING LEVERS SHALL BE TO THE WIDE SIDE OF THE STALL.

4. TRAPS FOR ALL LAVATORIES AND SINKS SHALL TRAP STRAIGHT BACK TO WALL WITH ALL REQUIRED OFFSETS HAPPENING WITHIN THE WALL.

5. ALL PLUMBING WORK SHALL BE INSTALLED TO AVOID INTERFERENCE WITH ELECTRICAL AND MECHANICAL EQUIPMENT AND STRUCTURAL FRAMING.

6. ALL CLEANOUTS SHALL BE INSTALLED WHERE EASILY ACCESSIBLE. THE CONTRACTOR SHALL COORDINATE ALL CLEANOUT LOCATIONS WITH ALL EQUIPMENT, CABINETS AND OTHER OBSTRUCTION PRIOR TO ANY INSTALLATION. CLEANOUTS MUST BE EXTENDED TO FLUSH WITH FINISHED WALL.

7. ALL PLUMBING FIXTURE VENTS SHALL TERMINATE A MINIMUM OF 12 INCHES FROM ANY VERTICAL SURFACE AND 10 FEET FROM ANY OUTSIDE AIR INTAKES.

8. ALL VALVES, UNIONS, ETC. TO BE SAME SIZE AS PIPE UNLESS OTHERWISE INDICATED ON PLANS.

9. UNIONS SHALL BE PROVIDED AND INSTALLED AFTER EACH VALVE AND PRIOR TO ALL EQUIPMENT CONNECTIONS.

10. ALL WORK AND MATERIAL SHALL BE IN COMPLIANCE WITH AND PERFORMED AND INSTALLED IN CONFORMANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THIS PROJECT:

    BUILDING STANDARDS ADMINISTRATIVE CODE, PART 1, TITLE 24 C.C.R.
    2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24 C.C.R.
    2022 CALIFORNIA ELECTRICAL CODE (CEC), PART 3, TITLE 24 C.C.R.
    2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24 C.C.R.
    2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24 C.C.R.
    2022 CALIFORNIA ENERGY CODE, PART 6, TITLE 24 C.C.R.
    2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24 C.C.R.
    2022 CALIFORNIA GREEN BUILDING CODE, PART 11, TITLE 24 C.C.R.
    2022 CALIFORNIA REFERENCED STANDARDS, PART 12, TITLE 24 C.C.R.
    2022 TITLE 19, CCR, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS
    2022 NFPA 13 – AUTOMATIC SPRINKLER SYSTEMS

11. BEFORE FABRICATION OR INSTALLATION THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS OF ALL MECHANICAL EQUIPMENT AND EQUIPMENT PROVIDED UNDER OTHER SECTIONS OF SPECIFICATIONS. ROUGH–IN LOCATIONS AND REQUIREMENTS SHALL BE COORDINATED IN THE FIELD.

12. ALL SEWER AND VENT PIPING SHALL HAVE A MINIMUM 1/4" PER FOOT (2%) SLOPE PER CPC SEC. 708.

13. ALL VALVES, TRAP PRIMERS, WATER HAMMER ARRESTERS OR OTHER EQUIPMENT LOCATED IN WALLS OR ABOVE NON–ACCESSIBLE CEILINGS SHALL BE INSTALLED BEHIND AN ACCESS PANEL. ALL PIPING & DEVICES SHALL BE INSTALLED ABOVE CEILING, WITHIN WALLS, BELOW FLOORS, OR OTHERWISE CONCEALED. EXCEPT PIPING AND DEVICES INSTALLED IN MECHANICAL ROOMS AND OTHER UNFINISHED SPACES.

14. ALL PLUMBING FIXTURES AND EQUIPMENT SHALL BE CERTIFIED BY THE CALIFORNIA STATE ENERGY COMMISSION TO COMPLY WITH EFFICIENCY STANDARDS PER SECTION 110 OF THE TITLE–24 REGULATIONS.

15. ALL HOT WATER SUPPLY & RETURN PIPING SHALL BE INSULATED. INSULATION SHALL HAVE A FLAME SPREAD OF NOT MORE THAN 25 AND A SMOKE DENSITY NOT EXCEEDING 50 PER CMC SEC. 12.1.2.1.8 SEE SPECIFICATION FOR OTHER REQUIREMENTS.

16. PIPING THROUGH FIRE RATED WALLS SHALL BE PROTECTED PER U.L. FIRE RESISTANCE SYSTEM NO. WL1001. THE ARCHITECTURAL DESIGN DRAWINGS SHALL INDICATE ALL RATED WALL LOCATIONS.

17. SLEEVES SHALL BE PROVIDED TO PROTECT THROUGH CONCRETE FLOORS.

18. SEISMIC BRACING AND ANCHORAGE REQUIREMENTS ARE AS FOLLOWS:

    A. THE SEISMIC ANCHORAGE FOR ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE DESIGNED TO WITHSTAND A LATERAL FORCE:

        1. CALCULATED AS SPECIFIED IN ASCE 7/16 AND 2022 CBC.

    B. THE ATTACHMENT OF THE FOLLOWING ITEMS SHALL BE DESIGNED TO RESIST THE FORCES PRESCRIBED IN PART 2, TITLE 24, 2019 CBC:

        1. EQUIPMENT WEIGHING MORE THAN 400 LBS. SUPPORTED DIRECTLY ON FLOOR OR ROOF.
        2. FURNITURE REQUIRED TO BE ATTACHED IN ACCORDANCE WITH PART 2, TITLE 24, C.C.R.
        3. TEMPORARY OR MOBILE EQUIPMENT.
        4. EQUIPMENT WEIGHING LESS THAN 20 LBS. SUPPORTED BY VIBRATION ISOLATORS.
        5. EQUIPMENT WEIGHING LESS THAN 20 LBS. SUSPENDED FROM A ROOF OR HUNG FROM A WALL.
        6. KITCHEN EQUIPMENT ON CASTERS ARE REQUIRED TO HAVE THEIR MOVEMENT LIMITED.

19. THE PLUMBING CONTRACTOR SHALL PROVIDE THE WATER & SEWER SYSTEMS TO A POINT OF CONNECTION 5'–0" OUTSIDE OF THE BUILDING. PIPING BEYOND THIS POINT IS SPECIFIED UNDER ANOTHER SECTION OF THE SPECIFICATIONS AND SHALL BE AS SHOWN ON THE CIVIL DRAWINGS. FINAL CONNECTIONS TO SITE PIPING SHALL BE BY THE PLUMBING CONTRACTOR.

20. WATER HAMMER ARRESTERS SHALL BE PROVIDED WHERE REQUIRED AND NECESSARY FOR AND TO ALL FIXTURES, EQUIPMENT OR APPLIANCES WITH QUICK CLOSING VALVE AND SHALL BE OF TYPE SPECIFIED.

21. ALL PIPE SIZES SHALL BE THE SAME AS THE UPSTREAM PIPE SIZES UNLESS OTHERWISE INDICATED ON PLAN.

22. CLEANOUT SHALL BE PROVIDED AS PER CPC SECTION 707.

23. NO STRUCTURAL MEMBER SHALL BE CUT, NEITHER DRILLED NOR NOTCHED WITHOUT PRIOR WRITTEN AUTHORIZATION FROM THE STRUCTURAL ENGINEER AND THE DIVISION OF THE STATE ARCHITECT.

24. THESE DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND ARE NOT INTENDED TO INDICATE ALL DETAILS AND NECESSARY OFFSETS OF PIPING. THE CONTRACTOR SHALL INSTALL MATERIAL AND EQUIPMENT IN A MANNER AS TO CONFORM TO STRUCTURE, AVOID OBSTRUCTIONS, PRESERVE HEADROOM, AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. ALL INSTALLATIONS SHALL BE CONSISTENT WITH NORMALLY ACCEPTABLE INDUSTRY STANDARDS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES OR CONFLICTS THAT WOULD EFFECT THE SYSTEM PERFORMANCE OR INCUR ADDITIONAL COSTS. THIS NOTIFICATION SHALL BE SUBMITTED PRIOR TO INSTALLATION OF THE ITEMS CONCERNED.

25. CONTRACTOR SHALL SIZE ALL SERVICE PIPING AND EQUIPMENT TO ACCOMMODATE FUTURE EXPANSION AS INDICATED ON THE ARCHITECTURAL DRAWINGS.

26. PROVIDE COMPLETE CONDENSATE DRAIN PIPING FOR ALL AC UNITS AND DISCHARGE CONDENSATE TO AN APPROVED RECEPTOR.

27. ALL LAYOUTS, PIPE SIZES, FIXTURE & EQUIPMENT SELECTIONS SHOWN ON THESE PLANS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL PROVIDE A COMPLETE PLUMBING SYSTEM. THE DESIGN, CALCULATIONS, FIXTURE, TRIM, EQUIPMENT AND MATERIALS SELECTIONS & DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL AS SPECIFIED.

28. INSULATION THICKNESS OR R–VALUE REQUIREMENT FOR HOT WATER PIPING, RETURN HOT WATER PIPING, THE FIRST 8 FEET OF COLD WATER OUTLET PIPING FROM THE WATER HEATER AND PIPING BETWEEN A STORAGE TANK AND A HEAT TRAP FOR A NONRECIRCULATING STORAGE SYSTEM AS PER SECTION 120.3(A) AND TABLE 120.3–A OF CEC 2019 ARE AS FOLLOWS:

    LESS THAN 1" DIAMETER – 1" (R–7.7)
    1" – 1–1/4" DIAMETER – 1–1/2" (R–12.5)
    1–1/2" – 3–1/2" DIAMETER – 1–1/2" (R–11)

29. NO GAS & WATER PIPE SHALL BE INSTALLED UNDER BUILDING SLAB. GAS & WATER PIPES SHALL RISE TIGHT AGAINST EXTERIOR WALL UP TO MIN. 18" AFF AND PENETRATE INTO BUILDING. PROVIDE SHUT–OFF VALVE AND REGULATOR ABOVE GRADE AT INCOMING GAS RISERS.

30. UNDERGROUND INSTALLATION OF WATER SHALL BE IN ACCORDANCE WITH CPC 609.2. INSTALLATION OF BUILDING SEWERS SHALL BE IN ACCORDANCE WITH CPC 718.3 & PROVISIONS UNDER CPC 720.1. GAS PIPING INSTALLATION SHALL BE IN ACCORDANCE WITH CPC 1210.

31. CONTRACTOR SHALL CAREFULLY REVIEW THESE PLANS AND SPECIFICATIONS PRIOR TO BID. CONTRACTOR SHALL ALSO REVIEW PLANS AND SPECIFICATIONS OF OTHER RELATED TRADES (INCLUDING MECHANICAL, CIVIL, STRUCTURAL, AND ELECTRICAL) PRIOR TO BID TO INSURE AN ACCURATE UNDERSTANDING OF EXACT SCOPE OF WORK. ANY ITEMS REQUIRING DESCRIPTION CLARIFICATION SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT IN SUFFICIENT TIME TO BE INCORPORATED INTO THE BID.

32. ALL PLUMBING SYSTEM COMPONENTS SHALL MEET OR EXCEED THE REQUIREMENTS OF C.B.C. (CALIFORNIA EDITION), CMC, CPC, NEC, NFPA, ASTM, ANSI, AND ALL LOCAL AND STATE CODE REQUIREMENTS.

33. ALL PLUMBING EQUIPMENT LISTED IN (CCR) SECTION 110 OF THE 2022 CALIFORNIA CODE OF REGULATIONS, TITLE–24, PART 6, ENERGY EFFICIENCY STANDARDS MUST BE CERTIFIED BY THE MANUFACTURER TO MEET OR EXCEED SPECIFICATIONS OR EFFICIENCIES ADOPTED BY THE CEC.

34. ALL PIPING EXPOSED TO WEATHER SHALL BE METALLIC.

35. ALL FERROUS PIPING EXPOSED TO WEATHER SHALL BE GALVANIZED.

36. ALL PIPES, FITTINGS AND FIXTURES USED TO CONVEY POTABLE WATER SHALL BE LEAD FREE IN COMPLIANCE WITH CALIFORNIA AB 1953.

37. ALL INSULATING MATERIALS INSTALLED MUST BE CERTIFIED BY CALIFORNIA ENERGY COMMISSION TO MEET C.E.C. ENERGY EFFICIENCY STANDARDS (E.E.S.) SECTION 120.3 AND SECTION 1201.2 OF CMC.

38. ALL INSULATION INSTALLED SHALL MEET THE FLAME SPREAD AND SMOKE DENSITY REQUIREMENTS OF SECTION 720 OF THE 2022 CBC.

39. ALL FIXTURES REQUIRED TO BE ACCESSIBLE SHALL BE INSTALLED AS PER THE LATEST REQUIREMENTS OF TITLE 24 AND ADA (AMERICANS WITH DISABILITIES ACT).

40. CROSS CONNECTION PROTECTION SHALL BE PROVIDED AT ALL POTABLE WATER SUPPLIED APPLIANCES AND EQUIPMENT (OTHER THAN THOSE LISTED IN INFORMATION BULLETIN 103).

CALGREEN BUILDING STANDARDS CODE 2022

CHAPTER 3 – GREEN BUILDING
SECTION 301 GENERAL
301.1 SCOPE. BUILDINGS SHALL BE DESIGNED TO INCLUDE THE GREEN BUILDING MEASURES SPECIFIED AS MANDATORY IN THE APPLICATION CHECKLISTS CONTAINED IN THIS CODE. VOLUNTARY GREEN BUILDING MEASURES ARE ALSO INCLUDED IN THE APPLICATION CHECKLISTS AND MAY BE INCLUDED IN THE DESIGN AND CONSTRUCTION OF STRUCTURES COVERED BY THIS CODE, BUT ARE NOT REQUIRED UNLESS ADOPTED BY A CITY, COUNTY, OR CITY AND COUNTY AS SPECIFIED IN SECTION 101.7.

SECTION 303 PHASED PROJECTS
303.1 PHASE PROJECTS. FOR SHELL BUILDING AND OTHERS CONSTRUCTED FOR FUTURE TENANT IMPROVEMENTS, ONLY THOSE CODE MEASURES RELEVANT TO THE BUILDING COMPONENTS AND SYSTEMS CONSIDERED TO BE NEW CONSTRUCTION (OR NEWLY CONSTRUCTED) SHALL APPLY.

303.1.1 TENANT IMPROVEMENTS. THE PROVISIONS OF THIS CODE SHALL APPLY ONLY TO THE INITIAL TENANT OR OCCUPANT IMPROVEMENTS TO A PROJECT.

SECTION 306 VOLUNTARY MEASURES
306.1 PURPOSE. FOR PUBLIC SCHOOLS AND COMMUNITY COLLEGES, APPENDIX A5, NON RESIDENTIAL VOLUNTARY MEASURES, IS PROVIDED AS A GUIDELINE TO FURTHER ENCOURAGE BUILDING PRACTICES THAT IMPROVE PUBLIC HEALTH, SAFETY AND GENERAL WELFARE BY PROMOTING THE USE OF BUILDING CONCEPTS WHICH IS MINIMIZE THE BUILDING'S IMPACT ON THE ENVIRONMENT, PROMOTE A MORE SUSTAINABLE DESIGN AND HIGH–PERFORMANCE EDUCATIONAL FACILITIES.

CHAPTER 5 – NON–RESIDENTIAL MANDATORY MEASURES
DIVISION 5.1 – PLANING AND DESIGN
SECTION 5.101 GENERAL
5.01 PURPOSE. THE PROVISIONS OF THIS CHAPTER OUTLINE PLANNING, DESIGN AND DEVELOPMENT METHODS THAT INCLUDE ENVIRONMENTALLY RESPONSIBLE SITE SELECTION, BUILDING DESIGN, BUILDING SITING AND DEVELOPMENT TO PROTECT, RESTORE AND ENHANCE THE ENVIRONMENTAL QUALITY OF THE SITE AND RESPECT THE INTEGRITY OF ADJACENT PROPERTIES.

DIVISION 5.2 – ENERGY EFFICIENCY
SECTION 5.201 GENERAL
5.201.1 SCOPE [BSC–CG] CALIFORNIA CODE [DSA–SS]. FOR THE PURPOSES OF MANDATORY ENERGY EFFICIENCY STANDARDS IN THIS CODE, THE CALIFORNIA ENERGY COMMISSION WILL CONTINUE TO ADOPT MANDATORY BUILDING STANDARDS.

DIVISION 5.3 – WATER EFFICIENCY AND CONSERVATION
SECTION 5.301 GENERAL
5.301.1 SCOPE.
THE PROVISIONS OF THIS CHAPTER SHALL ESTABLISH THE MEANS OF CONSERVING WATER USED INDOORS, OUTDOORS AND IN WASTEWATER CONVEYANCE.

5.303.2 RESERVED.
5.303.3 WATER CONSERVING PLUMBING FIXTURES AND FITTINGS.
PLUMBING FIXTURES (WATER CLOSETS AND URINALS) AND FITTINGS (FAUCET AND SHOWERHEADS) SHALL COMPLY WITH THE FOLLOWING:

5.303.3.1 WATER CLOSET.
THE EFFECTIVE FLUSH VOLUME OF ALL WATER CLOSET SHALL NOT EXCEED 1.28 GALLONS PER FLUSH. TANK–TYPE WATER CLOSET SHALL BE CERTIFIED TO THE PERFORMANCE CRITERIA OF THE U.S. EPA WATER SENSE SPECIFICATION FOR TANK–TYPE TOILETS.
NOTE: THE EFFECTIVE FLUSH VOLUME OF DUAL FLUSH TOILETS IS DEFINED AS THE COMPOSE, AVERAGE FLUSH VOLUME OF TWO REDUCED FLUSHES AND ONE FULL FLUSH.

5.303.3.2 URINALS.
5.303.3.2.1 WALL–MOUNTED URINALS.
THE EFFECTIVE FLUSH VOLUME OF WALL–MOUNTED URINALS SHALL NOT EXCEED 0.125 GALLONS PER FLUSH.
5.303.3.2.2 FLOOR–MOUNTED URINALS.
THE EFFECTIVE FLUSH VOLUME OF FLOOR–MOUNTED OR OTHER URINALS SHALL NOT EXCEED 0.5 GALLONS PER FLUSH.

5.303.3.3 SHOWERHEADS.
5.303.3.1 SINGLE SHOWERHEAD
SHOWERHEADS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 1.8 GALLONS PER MINUTES AT 80 PSI. SHOWERHEADS SHALL BE CERTIFIED TO THE PERFORMANCE CRITERIA OF THE US EPA WATER SENSE SPECIFICATIONS FOR SHOWERHEADS.
5.303.3.2 MULTIPLE SHOWERHEADS SERVING ONE SHOWER.
WHEN A SHOWER IS SERVED BY MORE THAN ONE SHOWERHEAD, THE COMBINED FLOW RATE OF ALL SHOWERHEADS AND/OR OTHER SHOWER OUTLETS CONTROLLED BY SINGLE VALVE SHALL NOT EXCEED 1.8 GALLONS PER MINUTE AT 80 PSI, OR THE SHOWER SHALL BE DESIGNED TO ALLOW ONLY ONE SHOWER OUTLET TO BE IN OPERATION AT A TIME.
NOTE: A HAND HELD SHOWER SHALL BE CONSIDERED A SHOWERHEAD.

5.303.3.4 FAUCETS AND FOUNTAINS.

5.303.3.4.1 NON–RESIDENTIAL LAVATORY FAUCETS.
LAVATORY FAUCETS SHALL HAVE A MAXIMUM FLOW RATE OF NOT MORE THAN 0.5 GALLONS PER MINUTES AT 60 PSI.

5.303.4.2 KITCHEN FAUCETS
KITCHEN FAUCETS SHALL HAVE A MAXIMUM FLOW RATE OF MORE THAN 1.8 GALLONS PER MINUTES AT 60 PSI. KITCHEN FAUCETS MAY TEMPORARILY INCREASE THE FLOW ABOVE THE MAXIMUM RATE, BUT NOT TO EXCEED 2.2 GALLONS PER MINUTES AT 60 PSI, AND MUST DEFAULT TO A MAXIMUM FLOW RATE OF 1.8 GALLONS PER MINUTES AT 60 PSI.

5.303.6 STANDARD FOR PLUMBING FIXTURES AND FITTINGS.
PLUMBING FIXTURES AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE CALIFORNIA PLUMBING CODE, AND SHALL MEET THE APPLIANCE STANDARD REFERENCED IN TABLE 1701.1 OF THE CALIFORNIA PLUMBING CODE IN CHAPTER 6 OF THIS CODE.

PLUMBING SPECIFICATIONS

1. GENERAL PROVISIONS – THE GENERAL CONDITIONS, SUPPLEMENTS AND AMENDMENTS SHALL GOVERN THIS DIVISION OF THE SPECIFICATIONS.

2. PROJECT REQUIREMENTS – PROVIDE ALL ITEMS, MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THE WORK OR OPERATIONS MENTIONED HEREIN, OR INDICATED ON THE DRAWINGS AND REASONABLY INFERRED THEREIN, AS REQUIRED TO MAKE A COMPLETE AND WORKING SYSTEM.

3. INTENT – WORK SHALL BE DONE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND THEIR INTENT, COMPLETE WITH ALL NECESSARY COMPONENTS, INCLUDING THOSE NOT NORMALLY SHOWN OR CALLED FOR, AND SHALL BE READY FOR OPERATION BEFORE ACCEPTANCE.

4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE CODES. NOTHING SHOWN IN THE PLANS OR STATED IN THE SPECIFICATIONS IS INTENDED TO INDICATE THAT THE INSTALLATION OR CONNECTIONS OF ANY ITEM OR DEVICE SHOULD BE DONE CONTRARY TO MANUFACTURERS INSTRUCTIONS AND ALL APPLICABLE CODES AND REGULATIONS. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THE INSTALLATION AND CONNECTIONS OF ALL ITEMS AND DEVICES CONFORMS TO MANUFACTURERS INSTRUCTIONS AND TO ALL APPLICABLE CODES AND REGULATIONS.

5. ANY REFERENCE TO THE DESIGN AUTHORITY SHALL MEAN MR ENGINEERING CONSULTANTS, INC.

6. THE WORK "PROVIDE" SHALL MEAN "SUPPLY AND INSTALL" UNLESS OTHERWISE INDICATED.

7. GOVERNING REGULATIONS – THE WORK UNDER PLUMBING SCOPE OF WORK, SHALL CONFORM, BUT NOT LIMITED TO THE REQUIREMENTS OF THE FOLLOWING CODES, REGULATIONS AND STANDARDS:

    A. 2022 EDITIONS OF THE CALIFORNIA BUILDING CODE, INCLUDING BUT NOT LIMITED TO THE MECHANICAL, PLUMBING, FIRE AND ENERGY CODES.

    B. OSHA REGULATIONS

8. PERMITS – OBTAIN ALL REQUIRED PERMITS AND PAY ALL FEES THEREFORE AND COMPLY WITH ALL LOCAL AND STATE REGULATIONS, CODES AND BY–LAWS APPLICABLE TO THE WORK.

9. RESPONSIBILITY – VISIT THE SITE BEFORE SUBMITTING A BID AND EXAMINE ALL LOCAL AND EXISTING CONDITIONS ON WHICH THE WORK IS DEPENDENT.

10. NO CONSIDERATION WILL BE GRANTED FOR ANY MISUNDERSTANDING OF WORK TO BE DONE RESULTING FROM FAILURE TO VISIT THE SITE.

11. WHEN THE CONTRACT DOCUMENTS DO NOT CONTAIN SUFFICIENT INFORMATION FOR THE PROPER SELECTION OF EQUIPMENT FOR BIDDING, NOTIFY THE DESIGN AUTHORITY DURING THE BIDDING PERIOD. IF CLARIFICATION CANNOT BE OBTAINED, ALLOW FOR THE MOST EXPENSIVE ARRANGEMENT. FAILURE TO DO THIS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO SUPPLY THE INTENDED EQUIPMENT AND OR INSTALLATION.

12. CHECK DRAWINGS OF ALL TRADES AND SITE SURVEY TO VERIFY SPACE AVAILABILITY FOR THE INSTALLATION. COORDINATE WORK WITH ALL TRADES AND MAKE CHANGES TO FACILITATE SATISFACTORY INSTALLATION. MAKE NO DEVIATIONS TO THE DESIGN INTENT INVOLVING EXTRA COST TO THE OWNER WITHOUT DESIGN AUTHORITY WRITTEN APPROVAL.

13. WORKMANSHIP – WORKMANSHIP SHALL BE IN ACCORDANCE WITH WELL ESTABLISHED PRACTICE AND STANDARDS ACCEPTED AND RECOGNIZED BY DESIGN AUTHORITY AND THE TRADE.

14. EMPLOY ONLY TRADESMEN HOLDING VALID TRADE QUALIFICATION CERTIFICATES. TRADESMEN SHALL PERFORM ONLY WORK THAT THEIR CERTIFICATE PERMITS.

15. DRAWING AND MEASUREMENTS – DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO INDICATE THE SCOPE AND GENERAL ARRANGEMENT OF WORK. DO NOT SCALE DRAWINGS.

16. TAKE FIELD MEASUREMENTS WHERE EQUIPMENT AND MATERIAL DIMENSIONS ARE DEPENDENT UPON BUILDING DIMENSIONS.

17. SUBMITTALS – SUBMIT THREE SETS OF ALL EQUIPMENT AND RELATED MATERIAL FOR APPROVAL PRIOR TO ORDERING.

18. RECORD DRAWINGS – MAINTAIN ONE CONTRACT DRAWING, WHITE PRINT, ON SITE, SOLELY FOR THE PURPOSE OF RECORDING, IN RED, ANY CHANGES AND/OR DEVIATION FROM THE CONTRACT DRAWINGS AS IT OCCURS.

19. AT THE COMPLETION OF THE PROJECT, CERTIFY THE ABOVE–MENTIONED DRAWINGS AS BEING ACCURATE AND COMPLETE BY LABELLING IN THE LOWER RIGHT HAND CORNER IN LETTERS OF AT LEAST ½ INCH HIGH AS FOLLOWS: "AS–BUILT DRAWINGS. DATED –––". DELIVER TO DESIGN AUTHORITY.

20. OPERATING AND MAINTENANCE MANUALS – PREPARE INSTRUCTION MANUALS WHICH INCLUDE EQUIPMENT MANUFACTURER'S OPERATING AND MAINTENANCE BULLETINS, AND A REPORT ON THE TESTING AND BALANCING. SUBMIT THREE (3) COPIES TO DESIGN AUTHORITY.

21. EXISTING SERVICES – PROTECT ALL EXISTING SERVICES AND MAKE GOOD ANY DAMAGE CAUSED BY THE WORK IN THIS CONTRACT.

22. CLEAN UP – MAKE GOOD AND CLEAN ALL AREAS DISRUPTED BY THIS WORK.

23. ARRANGEMENT AND ALIGNM,ENT OF PIPING:

    A. PIPING SHALL BE GROUPED (WHEREVER PRACTICAL) INSTALLED IN STRAIGHT PARALLEL LINES ALIGNED IN A UNIFORM DIRECT MANNER. CHANGES IN DIRECTION OF PIPING SHALL BE MADE WITH FITTINGS.

    B. PIPE LINES SHALL BE GUIDED, SUPPORTED AND ANCHORED IN SUCH MANNER THAT PIPE LINES SHALL NOT SAG OR BUCKLE.

24. JOINTS:

    A. PIPING TO EQUIPMENT SHALL BE CONNECTED WITH UNION FOR DISMANTLING AND REMOVAL.

    B. PIPING SHALL BE REAMED AFTER CUTTING. JOINTS WHEN COMPLETE SHALL BE THOROUGHLY CLEANED OF ALL EXCESS PIPE JOINT MATERIALS.

    C. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR PIPING CONNECTIONS.

25. HANGERS AND SUPPORTS:

    A. PIPING EQUIPMENT, ETC., SHALL BE PROPERLY SUPPORTED WITH THE USE OF APPROVED TYPE CLEVIS AND/OR TRAPEZE HANGERS SPACED 5'–0" ON CENTERS FOR CAST IRON PIPING AND 8'0" ON CENTERS FOR WATER PIPING.

    B. PIPING AND EQUIPMENT SHALL BE SUPPORTED FROM WALLS, JOISTS OR STRUCTURAL STEEL GIRDERS ONLY.

26. PLUMBING FIXTURES:

    A. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL FIXTURES INCLUDED IN THE CONTRACT FROM DAMAGE CAUSED BY ACIDS, BUILDING MATERIALS, TOOLS, EQUIPMENT, ETC. UPON COMPLETION OF THE CONTRACT, OR WHEN DIRECTED, PLUMBING CONTRACTOR SHALL CLEAN ALL FIXTURES TO THE SATISFACTION OF THE DESIGN AUTHORITY.

    B. WHERE FIXTURES ARE DAMAGED, SAID FIXTURES SHALL BE REPLACED BY THE PLUMBING CONTRACTOR IMMEDIATELY UPON NOTIFICATION.

    C. ALL EQUIPMENT FURNISHED BY OWNERS THAT REQUIRE PLUMBING CONNECTION SHALL BE INSTALLED BY THE PLUMBING CONTRACTOR. PROVIDE SHUT–OFF VALVE ON WATER SUPPLY WERE REQUIRED BY CODE.

    D. EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTION.

    E. FIXTURES SHALL BE SECURED WITH MOUNTING BOLTS FROM CARRIERS OR HANGERS.

    F. FIXTURES SHALL BE INSTALLED LEVEL, PLUMB.

    G. FITTINGS SHALL BE NEATLY INSTALLED, MOUNTED TO FIXTURES PRIOR TO INSTALLATION OF FIXTURES. PROVIDE NON–HARDENING PUTTY BETWEEN FITTINGS AND FIXTURE SURFACES.

    H. FITTINGS SHALL BE SECURED WITHOUT MARRING OR DAMAGING CHROME PLATING.

27. INSULATION:

    A. DOMESTIC HOT WATER PIPING SHALL BE 2022 CEC TABLE 120.3–A COMPLIANCE

28. TESTS:

    A. TEST SYSTEMS AS REQUIRED BY THE BUILDING CODE.

    B. PLUMBING FIXTURES ROUGHING, UNDERGROUND PIPING, PIPING IN FLOOR CONSTRUCTION OR PIPE CHASE WALLS SHALL BE INSTALLED AND TESTED BEFORE CONCEALMENT.

    C. FOR FITTINGS A "STEP TEST" SHALL BE FOLLOWED, UTILIZING AIR, WATER OR DRY NITROGEN, FOLLOW MANUFACTURER'S GUIDELINES AND RECOMMENDATIONS.

    D. TEST EQUIPMENT CONTROLS FOR PROPER PERFORMANCE AND MAKE NECESSARY ADJUSTMENTS IN THE PRESENCE OF A FACTORY AUTHORIZED REPRESENTATIVE OF THE EQUIPMENT MANUFACTURER.

29. DISINFECTION:

    A. DISINFECT DOMESTIC WATER PIPING SYSTEMS AS REQ. BY THE BUILDING CODE.

    B. DISINFECT ALL POTABLE WATER PIPING SYSTEMS AT THE COMPLETION OF THE PROJECT PRIOR TO BUILDING OCCUPANCY AS FOLLOWS:

        1. FLUSH THOROUGHLY WITH POTABLE WATER.

        2. FILL SYSTEM WITH WARE–CHLORINE SOLUTION CONTAINING 50% PARTS PER MILLION OF CHLORINE AND ALLOW TO STAND FOR 24 HOURS.

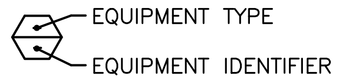
        3. FILL SYSTEM WITH WATER–CHLORINE SOLUTION CONTAINING 200% PARTS MILLION OF CHLORINE AND ALLOW TO STAND FOR (3) HOURS.

        4. FLUSH SYSTEM WITH POTABLE WATER TO REMOVE ALL CHLORINE. PERFORM ANY ADDITIONAL TESTS OR TREATMENT AS REQUIRED BY THE LOCAL AUTHORITY.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
RPBP	RPBP	REDUCE PRESSURE ZONE BACKFLOW PREVENTER
◕	POC/POD	POINT OF CONNECTION / POINT OF DISCONNECTION
SS	SS	SANITARY SEWER PIPING
GW	GW	GREASE WASTE PIPING
	V	VENT PIPING
	CW	DOMESTIC COLD WATER PIPING
	HWS	DOMESTIC HOT WATER SUPPLY PIPING
	HWR	DOMESTIC HOT WATER RETURN PIPING
CD	CD	CONDENSATE DRAIN PIPING
		PIPE DOWN
		PIPE UP
		PIPE BRANCH – TOP CONNECTION
		PIPE BRANCH – BOTTOM CONNECTION
		PIPE BRANCH – SIDE CONNECTION
		PIPE CAP
		PIPE SLEEVE
		DIRECTION OF FLOW
		PIPE SLOPE & DIRECTION OF FALL
		THERMOMETER
	WHA	WATER HAMMER ARRESTOR
		PIPE BREAK
	WCO	WALL CLEANOUT
		PIPE CONTINUATION
	FCO/COTG	FLOOR CLEANOUT OR CLEANOUT TO GRADE
	FD	FLOOR DRAIN
	FS	FLOOR SINK
	SOV	SHUT OFF VALVE, PLAN / RISER
	PRV	PRESSURE REDUCING VALVE
		GAS VALVE /PLUG COCK
		PRESSURE GAUGE
		PIPE REDUCER/INCREASER
		CIRCUIT SETTER/BALACING VALVE
	BLV	BALANCING VALVE
		SOLENOID VALVE
	SGV	SEISMIC GAS SHUT–OFF VALVE
	BV	BALL VALVE
	CV	CHECK VALVE
/ Ⓟ	PG	PRESSURE GAUGE
	TMV	THERMOSTATIC MIXING VALVE
	RV	SAFETY RELIEF VENT
		PIPE UNION
	HB	HOSE BIBB
		HOSE END GATE VALVE WITH HOSE CAP
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	ARCH	ARCHITECT OR ARCHITECTURAL
	B/C	BELOW COUNTER
	B/G	BELOW GRADE
	B/S	BELOW SLAB
	C.I.	CAST IRON
	CCO	CEILING CLEAN OUT
	DWG/DWGS	DRAWING/DRAWINGS
	DN	DOWN
	EA	EACH
	ELECT	ELECTRICAL
	ELEV	ELEVATION
	°F	DEGREES FAHRENHEIT
	F/A – F/B	FROM ABOVE – TO BELOW
	FFE	FINISHED FLOOR ELEVATION
	FH	FUME HOOD
	FT	FEET
	FT HD	FEET OF HEAD
	GPF	GALLONS PER FLUSH
	GPM	GALLONS PER MINUTE
	GA	GAUGE
	HB	(+18")
	HD	HEAD
	H\L – H\L	HIGH LEVEL – LOW LEVEL
	IPS	IRON PIPE SIZE
	I.E.	INVERT ELEVATION
	MAX	MAXIMUM
	MAU	MAKE AIR UNITS
	TP	TRAP PRIMER
	MIN	MINIMUM
	MTD	MOUNTED
	NTS	NOT TO SCALE
	PVC	POLYVINYL CHLORIDE PIPE
	PSI	POUNDS PER SQUARE INCH
	P&TRV	PRESSURE AND TEMPERATURE RELIEF VALVE
	QTY	QUANTITY
	SOV	SHUT OFF VALVE
	SQ FT	SQUARE FEET
	T/A – T/B	TO ABOVE / TO BELOW
	TYP	TYPICAL
	VCP	VITRIFIED CLAY PIPE
	VTR	VENT THRU ROOF

EQUIPMENT IDENTIFICATION SYMBOL



SCOPE OF WORK

1. PLUMBING LAYOUT FOR SHELL BUILDING OF A COMMERCIAL SPACE.
2. CODE COMPLIANCE OF THE COMMERCIAL SPACE.

DRAWING INDEX

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P4.2 PLUMBING DETAILS

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SHEET TITLE

PLUMBING GENERAL NOTES, 2022 CAL GREEN, SPECIFICATION, LEGEND AND SYMBOLS

NO.	DATE	DESCRIPTION

PROJECT #: A2306-AD441
DRAWN: LJT CHECKED: TP
SCALE: AS SHOWN DATE: 12.04.2023
SHEET

P0.1

HYDRAULIC CALCULATION

DESCRIPTION	UNITS	REMARKS
(A). PRESSURE IN STREET (psi) :	59.7	RESIDUAL PRESSURE AT 59 GPM
(B). LOSS ACROSS METER (psi) :	7.2	(N) 1–1/2" WATER METER
(C). LOSS ACROSS BACKFLOW PREVENTER (psi) :	5.0	(N) 2" REDUCED PRESSURE ZONE ASSEMBLY "ZURN" MODEL: 950XL3, OR AN APPROVED EQUAL
(D). LOSS AFTER PRV (psi) :		N/A
(E). ELEVATION LOSS (psi) :	0.0	
STATIC HEIGHT (ft) :	0.0	
(F). RESIDUAL PRESSURE REQUIRED (psi) :	30.0	REQUIRED PRESSURE AS STATED IN CPC
(G). DEVELOPED LENGTH OF BUILDING PIPING (ft) :	234.0	180 x 1.3 (FOR PIPES & FITTINGS LOSSES)
(H). PRESSURE AVAILABLE FOR FRICTION LOSSES IN BUILDING PIPING (psi) :	17.50	A – (B + C + E + F)
(I). ALLOWABLE LOSSES PER 100FT OF BUILDING PIPING (psi) :	7.04	6.95 FT / 100 FT X 234 FT = 16.26 FT X 0.433 PSI / FT = 7.04 PSI

PIPE SIZE TABLE

PIPE SIZE	COLD WATER				HOT WATER		
	GPM	FLUSH TANK FIXTURE UNIT	FLUSH VALVE FIXTURE UNIT	VELOCITY (FT/S)	GPM	FLUSH TANK FIXTURE UNIT	VELOCITY (FT/S)
1/2"	2.8	2.7	–	3.9	2.8	2.7	3.9
3/4"	7.3	8.6	–	4.8	7.3	8.6	4.8
1"	14.6	20.6	–	5.7	12.9	17.7	5.0
1–1/4"	25.2	42.3	8.2	6.4	19.6	29.2	5.0
1–1/2"	39.5	84.5	27.0	7.1	27.7	48.2	5.0
2"	77.2	259.8	136.7	8.0	48.2	119.9	5.0
2–1/2"	119.0	474.2	357.8	8.0	74.4	246.7	5.0
3"	169.9	747.1	699.0	8.0	106.2	411.8	5.0

NOTES:
1. HYDRAULIC CALCULATIONS ARE BASED UPON CPC 2022.
2. COLD WATER NOT TO EXCEED 8 FEET PER SECOND.
3. HOT WATER NOT TO EXCEED 5 FEET PER SECOND.

ESTIMATED FUTURE PLUMBING LOADS

DESCRIPTION	DOMESTIC COLD WATER		SANITARY SEWER		GREASE WASTE	
	WSFU	PIPE (IN)	DFU	PIPE (IN)	DFU	PIPE (IN)
FUTURE RETAIL	77.5	2"	27	4"	27	4"
TOTAL LOAD	77.5	2"	27	6"	27	4"

TABLE 120.3-A PIPE INSULATION THICKNESS

FLUID TEMPERATURE RANGE (°F)	CONDUCTIVITY RANGE (IN BTU–INCH PER HOUR PER SQUARE FOOT PER °F)	INSULATION MEAN RATING TEMPERATURE (°F)	NOMINAL PIPE DIAMETER (IN INCHES)		
			<1	<1 TO <1.5	<1.5 TO <4
			INSULATION THICKNESS REQUIRED (IN INCHES)		
SPACE HEATING, HOT WATER SYSTEMS (STEAM, STEAM CONDENSATE AND HOT WATER) AND SERVICE WATER HEATING SYSTEMS (RECIRCULATING SECTIONS, ALL PIPING IN ELECTRIC TRACE TAPE SYSTEMS, AND THE FIRST 8 FEET OF PIPING FROM THE STORAGE TANK FOR NONRECIRCULATING SYSTEMS)					
ABOVE 350	0.32–0.34	250	4.5	5.0	5.0
251–350	0.29–0.32	200	3.0	4.0	4.5
201–250	0.27–0.30	150	2.5	2.5	2.5
141–200	0.25–0.29	125	1.5	1.5	2.0
105–140	0.22–0.28	100	1.0	1.5	1.5
NOTE: PIPE INSULATION THICKNESS RANGE (105 – 200°F FLUID TEMPERATURE)					

PLUMBING FIXTURE & EQUIPMENT SCHEDULE

TAG	DESCRIPTION	WASTE			VENT	WATER		SPECIFICATION
		DIRECT	INDIRECT	TRAP		CW	HW	
HB 1	HOSE BIBB	–	–	–	–	3/4"	–	HOSE BIBB: "ZURN", MODEL: Z1350–RK–VB, ENCASED NARROW WALL HYDRANT COMPLETE WITH BRONZE BODY, ALL BRONZE INTERIOR PARTS, REPLACEABLE SEAT WASHER, SCREWDRIVER–OPERATED STOP VALVE IN SUPPLY, KEY OPERATED CONTROL VALVE, AND THREADED MALE HOSE CONNECTOR WITH VACUUM BREAKER.
TP 1	TRAP PRIMER	–	–	–	–	1/2"	–	TRAP PRIMER: "MIFAB", MODEL: M–500, PRESSURE DROP ACTIVATED, BRASS CONSTRUCTION. PROVIDE WITH MULTIPLE DISTRIBUTION UNIT (IF APPLICABLE), PROVIDE WITH APPROVED ACCESS PANEL.
RD/OF	ROOF DRAIN/ OVER FLOW	3"	–	–	–	–	–	ROOF DRAIN/ OVER FLOW DRAIN: "ZURN" MODEL: RD2130–NH4, NO–HUB, DURA–COATED CAST IRON BODY, COMBINATION ROOF DRAIN AND OVERFLOW.
GI 1	GRAVITY GREASE INTERCEPTOR	4"	–	–	2"	–	–	GRAVITY GREASE INTERCEPTOR: "JENSEN PRECAST" MODEL: MU–1200–EE–G, TANK MU 1200 GALLON 4 INCH LAYOUT GRAVITY GREASE INTERCEPTOR 24"E, 24"E SINGLE BAFFLE, IN COMPLIANCE WITH UNIFORM PLUMBING CODE (UPC), INTERNATIONAL PLUMBING CODE (IPC), ASTM INTERNATIONAL C1613, LISTED BY IAPMO R&T TO STANDARD Z1001, LOAD CONDITION 1: H–20 TRAFFIC WITH DRY SOIL CONDITIONS (WATER LEVEL BELOW TANK) AND 13 INCHES TO 14 FEET OF SOIL COVER, LOAD CONDITION 2: H–20 TRAFFIC WITH WATER LEVEL 2 FEET BELOW GRADE AND 13 INCHES TO 9 FEET OF SOIL COVER, MUST BE INSTALLED PER "JENSEN PRECAST UNDERGROUND WASTEWATER PRECAST CONCRETE TANK INSTALLATION PROCEDURE" THIS PROCEDURE ADDRESSES REQUIRED EXCAVATION, SITE PREPARATION, INSTALLATION, VENTILATION, AND WATER/VACCUM TESTING, (BY CIVIL WORKS); OR AN APPROVED EQUAL.
FD	FLOOR DRAIN	3"	–	3"	1–1/2"	–	–	FLOOR DRAIN: "ZURN" MODEL: Z415B, NO–HUB, DURA–COATED CAST IRON BODY, NICKEL BRONZE TOP TYPE 'B' STRAINER WITH TRAP PRIMER CONNECTION.
FS	FLOOR SINK	3"	–	3"	1–1/2"	–	–	FLOOR SINK: "ZURN" MODEL: Z1910–2, ENAMELED CAST IRON FLOOR SINK 8"x8"x6" DEPTH WITH ACID–RESISTANT COATING. HALF GRATE.
WCO	WALL CLEAN OUT	SEE RISER		–	–	–	–	WALL CLEAN OUT: "ZURN" MODEL: ZS1468 ROUND STAINLESS STEEL WALL ACCESS COVER COMPLETE WITH SECURING SCREW AND BRONZE RAISED HEX HEAD PLUG.
FCO	FLOOR CLEAN OUT	SEE LAYOUT		–	–	–	–	FLOOR CLEAN OUT: "ZURN" MODEL: CO–2400–NH4, FINISHED AREA ADJUSTABLE CLEANOUT WITH HEAVY DUTY TOP.
COTG	CLEAN OUT TO GRADE	SEE LAYOUT		–	–	–	–	CLEAN OUT TO GRADE: "ZURN" MODEL: CO–2410, CLEAN OUT BODY AND PLUG,

NOTES:
1. CONTRACTOR MAY SUBSTITUTE APPROVED EQUIVALENTS FOR SPECIFIED FIXTURES WITH OWNER'S AND ENGINEER'S APPROVAL. PROVIDED ALL THE REQUIREMENTS OF THE APPLICABLE CODE ARE MET.
2. CONTRACTOR TO SUBMIT CUT–SHEETS OF ALL FIXTURES FOR OWNER'S REVIEW AND APPROVAL PRIOR TO INSTALLATION.

MINIMUM PLUMBING REQUIREMENT

BLDG #	BUILDING TYPE	DESCRIPTION	S.F.	OCCUPANT LOAD FACTOR	OCCUPANT			WATER CLOSET			LAVATORY			URINAL	DRINKING FOUNTAIN	SERVICE SINK	REMARKS
					MALE	FEMALE	TOTAL	MALE	FEMALE	UNISEX	MALE	FEMALE	UNISEX				
1	M	FUTURE RETAIL	2630	100	13	13	26	1	1		1	1		0	1	1	SEE FOOT NOTE # 1, 2 & 3

BASED ON CPC 2022, TABLE 422.1, MINIMUM PLUMBING FACILITIES, AND TABLE A, OCCUPANT LOAD FACTOR.
NOTE:
1. ALL WATER CLOSET FIXTURE & URINAL ARE FLUSH VALVE.
2. DRINKING FOUNTAIN SHALL NOT REQUIRED FOR AN OCCUPANT LOAD OF 30 OR LESS, SECTION 415.2 CPC 2022.
3. SEPARATE FACILITIES, (3) 50 OR LESS TOTAL OCCUPANT LOAD SHALL BE PERMITTED FOR USED BY BOTH SEXES, CPC 2022, SECTION 422.2.

GRAVITY GREASE INTERCEPTOR SIZING TABLE

DRAINAGE FIXTURE UNITS (DFUs)	INTERCEPTOR VOLUMES (Gallons)
8	500
21	750
35	1000
90	1250
172	1500
216	2000
307	2500
342	3000
428	4000
TABLE 1014.3.6, CPC 2022	

PLUMBING PIPE MATERIAL SCHEDULE

SERVICE	LOCATION	PIPE MATERIAL	SLOPE
WATER	ABOVE GRADE	ASTM B88 TYPE "L" HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS.	1/32" PER 1'
	BELOW GRADE	ASTM B88 TYPE "K" HARD DRAWN COPPER, FACTORY INSULATED, WITH WROUGHT COPPER BRAZED JOINT FITTINGS.	1/32" PER 1'
SEWER AND VENT	ABOVE GRADE	ASTM A888 SERVICE WEIGHT HUBLESS CAST IRON, ALL FITTINGS SHALL BE AS PER CPC.	1/4" PER 1'
	BELOW GRADE	ABS SCHEDULE 40 (CONFORM TO ASTMD 2321–2000), ALL FITTINGS SHALL BE AS PER CPC.	1/4" PER 1'
STORM DRAIN	ABOVE GRADE	ABS SCHEDULE 40 (CONFORM TO ASTMD 2321–2000), ALL FITTINGS SHALL BE AS PER CPC.	1/4" PER 1'
	BELOW GRADE	ABS SCHEDULE 40 (CONFORM TO ASTMD 2321–2000), ALL FITTINGS SHALL BE AS PER CPC.	1/4" PER 1'
CONDENSATE	ABOVE GRADE	ASTM B88 TYPE "L" HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS.	1/8" PER 1'

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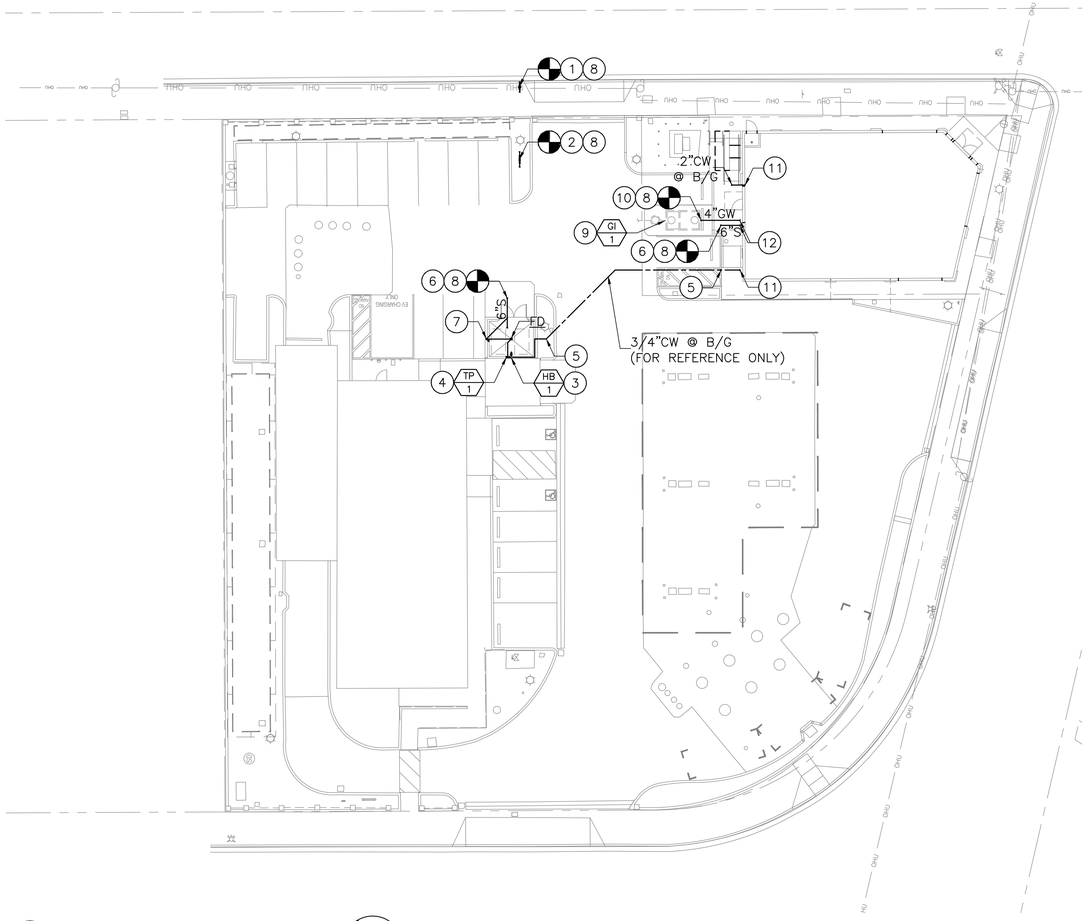
PLUMBING SCHEDULES

NO.	DATE	DESCRIPTION

PROJECT #: A2306-AD441
DRAWN: LJT CHECKED: TP
SCALE: AS SHOWN DATE: 12.04.2023

SHEET

P0.2



1 P2.0 PLUMBING SITE PLAN

SCALE: 1"= 20'-0"

GENERAL NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL PIPING AND UTILITIES PRIOR TO START OF WORK. IN THE EVENT OF ANY DISCREPANCIES OR POTENTIAL CONFLICTS, NOTIFY THE ARCHITECT AND ENGINEER IN WRITING PRIOR TO START OF WORK.

B. ALL PIPING LOCATIONS ARE DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND OWNER'S REPRESENTATIVE AND VERIFY EXACT ROUTING PRIOR TO START OF WORK.

C. CONTRACTOR TO VERIFY INVERT ELEVATION PRIOR TO WORK. IF INVERT LEVEL IS LOWER THAN THE LEVEL AT POINT OF CONNECTION EVEN AFTER THE ADJUSTMENTS IN SLOPE, AN EJECTOR PUMP SHALL BE PROVIDED.

D. ALL PIPING AND APPURTENANCES (WATER LINE, SEWER LINE, STORM DRAIN LINE, ETC) BEYOND 5 FEET FROM THE BUILDING IS SCOPE BY CIVIL. PIPING SHOWN ARE FOR REFERENCE ONLY.

E. THE PLUMBING CONTRACTOR SHALL PROVIDE THE WATER & SEWER SYSTEMS TO A POINT OF CONNECTION 5'-0" OUTSIDE OF THE BUILDING. PIPING BEYOND THIS POINT IS SPECIFIED UNDER ANOTHER SECTION OF THE SPECIFICATIONS AND SHALL BE AS SHOWN ON THE CIVIL DRAWINGS. FINAL CONNECTIONS TO SITE PIPING SHALL BE BY THE PLUMBING CONTRACTOR.

SHEET NOTES:

1. CIVIL/SITE CONSULTANT TO PROVIDE 2" COLD WATER LINE AND 1-1/2" WATER METER FOR RETAIL BUILDING. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND POINT OF CONNECTION AS PER SITE CONDITION.
2. CIVIL/SITE CONSULTANT TO PROVIDE ASSE 1013 COMPLIANT REDUCED PRESSURE ZONE ASSEMBLY BACK FLOW PREVENTER. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND POINT OF CONNECTION AS PER SITE CONDITION.
3. 3/4" COLD WATER PIPE DOWN IN WALL FOR RECESSED TYPE WALL HYDRANT AT TRASH ENCLOSURE. PROVIDE ASSE 1019 COMPLIANT VACUUM BREAKER.
4. 1/2" COLD WATER DOWN IN WALL TO TRAP PRIMER. TRAP PRIMERS SHALL BE HARD DRAWN WITH CONTINUOUS SLOPE.
5. 3/4" COLD WATER AT BELOW GROUND TO HOSE BIBB AT TRASH ENCLOSURE.
6. POINT FOR CONNECTION FOR 6" SEWER WASTE LINE. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION, INVERT ELEVATION, AND POINT OF CONNECTION AS PER SITE CONDITION.
7. 3" SEWER PIPE RUN BELOW GRADE FROM FLOOR DRAIN AT TRASH ENCLOSURE WITH WALL CLEAN OUT AND 1-1/2 VENT THRU ROOF. PROVIDE ROOF CAP WITH INSECT SCREEN. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND POINT OF CONNECTION AS PER SITE CONDITION.
8. SEE CIVIL PLANS FOR CONTINUATION.
9. 1200 GALLON UNDERGROUND GRAVITY GREASE INTERCEPTOR & SAMPLE BOX. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND POINT OF CONNECTION AS PER SITE CONDITION.
10. POINT FOR CONNECTION FOR 4" GREASE WASTE LINE. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION, INVERT ELEVATION, AND POINT OF CONNECTION AS PER SITE CONDITION.
11. REFER TO SHEET P2.1#1 FOR CONTINUATION
12. REFER TO SHEET P2.1#2 FOR CONTINUATION

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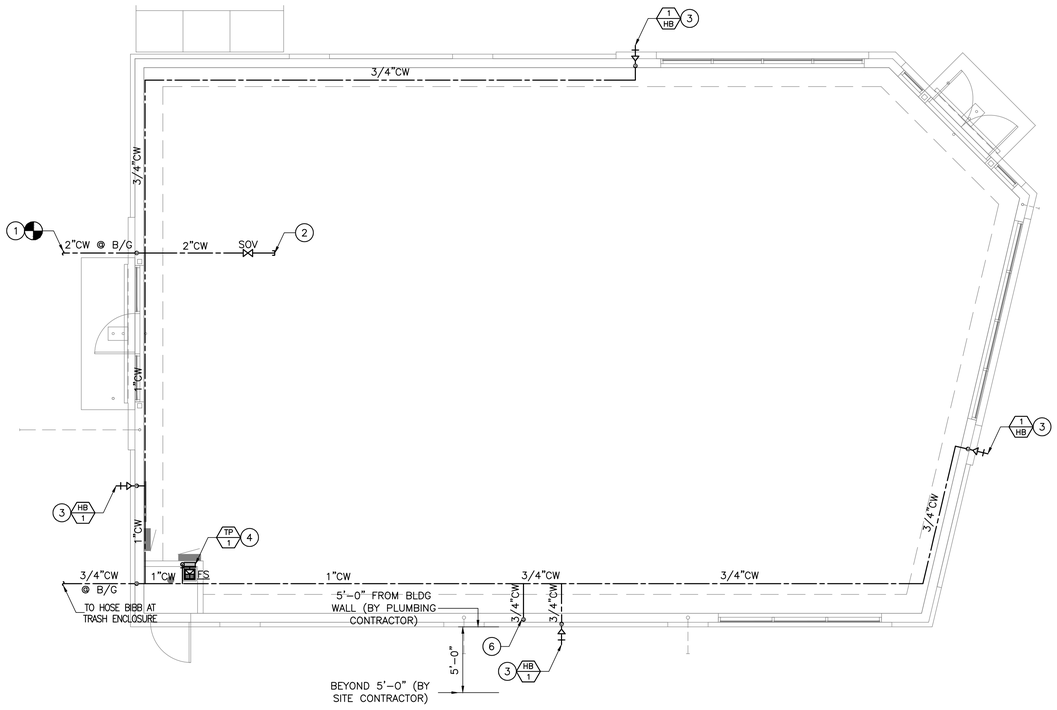
PLUMBING
SITE PLAN

NO.	DATE	DESCRIPTION

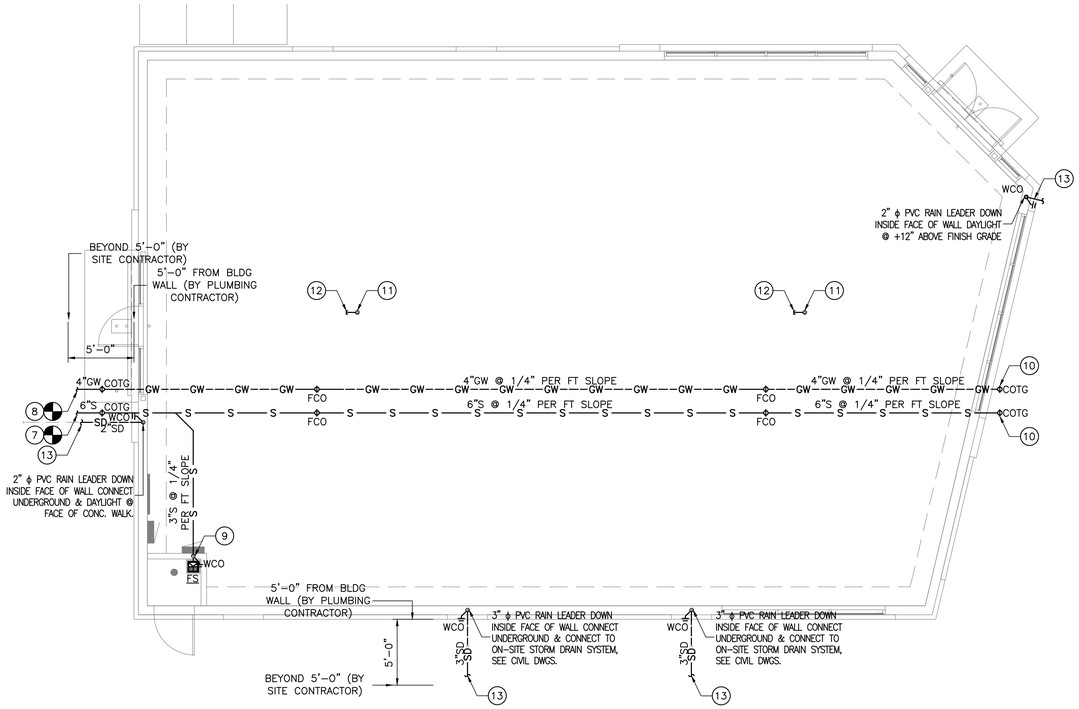
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SHEET

P2.0



1 P2.1 **PLUMBING PLAN - WATER LAYOUT**
SCALE: 3/16"=1'-0"



2 P2.1 **PLUMBING SEWER & VENT LAYOUT**
SCALE: 3/16"=1'-0"

GENERAL NOTES

A. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL PIPING AND UTILITIES PRIOR TO START OF WORK. IN THE EVENT OF ANY DISCREPANCIES OR POTENTIAL CONFLICTS, NOTIFY THE ARCHITECT AND ENGINEER IN WRITING PRIOR TO START OF WORK.

B. ALL PIPING LOCATIONS ARE DIAGRAMMATIC. CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND OWNER'S REPRESENTATIVE AND VERIFY EXACT ROUTING PRIOR TO START OF WORK.

C. CONTRACTOR SHALL VERIFY AND FINALIZED THE INVERT ELEVATION.

D. CONTRACTOR TO VERIFY INVERT ELEVATION PRIOR TO WORK. IF INVERT LEVEL IS LOWER THAN THE LEVEL AT POINT OF CONNECTION EVEN AFTER THE ADJUSTMENTS IN SLOPE, AN EJECTOR PUMP SHALL BE PROVIDED.

SHEET NOTES:

1. 2" BUILDING SUPPLY PIPE WITH ISOLATION VALVE. CONTRACTOR TO VERIFY EXACT LOCATION. REFER TO SHEET 2.0 FOR CONTINUATION.
2. 2" WATER SUPPLY STUB-OUT WITH ISOLATION VALVE AT HIGH LEVEL. CAPPED FOR FUTURE USE.
3. 3/4" COLD WATER PIPE DOWN IN WALL FOR RECESSED TYPE WALL HYDRANT. PROVIDE ASSE 1019 COMPLIANT VACUUM BREAKER.
4. 1/2" COLD WATER DOWN IN WALL TO TRAP PRIMER. TRAP PRIMERS SHALL BE HARD DRAWN WITH CONTINUOUS SLOPE.
5. 3/4" COLD WATER PIPE UP IN WALL FOR RECESSED TYPE WALL HYDRANT. PROVIDE ASSE 1019 COMPLIANT VACUUM BREAKER.
6. 3/4"CW PIPE TO ABOVE
7. POINT FOR CONNECTION FOR 6" SEWER WASTE LINE. CONTRACTOR TO VERIFY AT SITE. CONTRACTOR TO VERIFY INVERT ELEVATION AND EXACT POINT OF CONNECTION AT SITE.
8. POINT FOR CONNECTION FOR 4" GREASE WASTE LINE. SHOWN HERE FOR REFERENCE ONLY. CONTRACTOR TO FIELD VERIFY EXACT LOCATION, INVERT ELEVATION, AND POINT OF CONNECTION AS PER SITE CONDITION.
9. 3" SEWER PIPE RUN BELOW GRADE FROM FLOOR SINK WITH 1-1/2 VENT THRU ROOF. PROVIDE ROOF CAP WITH INSECT SCREEN.
10. ALL COTG'S AND FCO'S COVER TO BE PROPERLY TAG OF CORRESPONDING WASTE LINE.
11. 1-1/4" CONDENSATE DRAIN PIPE DOWN THRU ROOF FROM ROOF TOP UNITS.
12. 1-1/4" CONDENSATE DRAIN PIPE FROM ROOF TOP AC UNIT SHOULD BE CAPPED AND STUBBED INTO SPACE BELOW, AND CONNECTION TO FUTURE FLOOR SINK/MOP SINK. THIS SHALL BE PART OF TENANT IMPROVEMENT. CONDENSATE WASTE PIPING SHALL BE INDEPENDENT FROM OTHER WASTE AND DRAINAGE SYSTEMS. (SHALL NOT DRAIN INTO ROOF DRAINAGE SYSTEM). CPC SEC. 814.1.
13. STORM DRAIN (PRIMARY) DOWN IN WALL AND CONNECT TO ON-SITE STORM DRAIN LINE, SEE CIVIL DWGS. CONTRACTOR TO VERIFY POINT OF CONNECTION. PROVIDE WALL CLEAN OUT.
14. STORM DRAIN OVER FLOW PIPE (SECONDARY) TO DISCHARGE TO DAYLIGHT AS PER APPROVAL OF AHJ. PROVIDE DOWNSPOUT NOZZLE "ZURN" MODEL: Z199.

TABLE 1103.1
SIZING ROOF DRAINS, LEADERS, AND VERTICAL RAINWATER PIPING [2] [3]

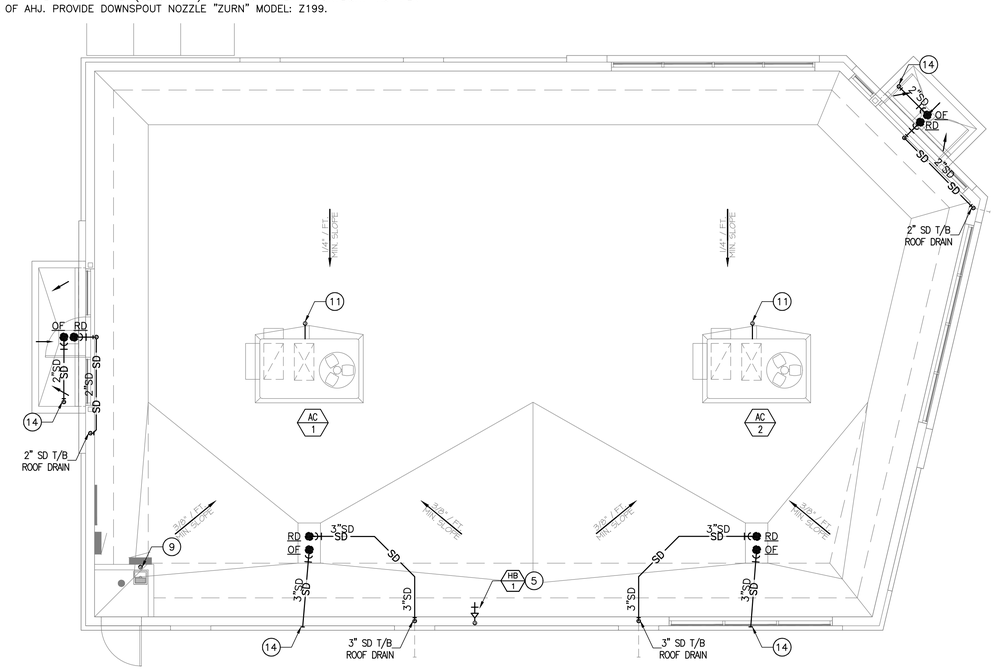
SIZE OF DRAIN,LEADER OR PIPE	FLOW	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREA AT VARIOUS RAINFALL RATES (SQUARE FEET)				
INCHES	GPM [1]	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)
2	30	2880	1440	960	720	575
3	92	8800	4400	2930	2200	1760
4	192	18400	9200	6130	4600	3680
5	360	34600	17300	11530	8650	6920
6	563	54000	27000	17995	13500	10800
8	1208	116000	58000	38660	29000	23200

TABLE 1103.2
SIZING OF HORIZONTAL RAINWATER PIPING [1] [2]

SIZE OF PIPE	FLOW (1/8" PER FOOT SLOPE)	MAXIMUM ALLOWABLE HORIZONTAL PROJECTED ROOF AREA AT VARIOUS RAINFALL RATES (SQUARE FEET)				
INCHES	GPM	1 (in/h)	2 (in/h)	3 (in/h)	4 (in/h)	5 (in/h)
3	34	3288	1644	1096	822	657
4	78	7520	3760	2506	1880	1504
5	139	13360	6680	4453	3340	2672
6	222	21400	10700	7133	5350	4280
8	478	46000	23000	15330	11500	9200
10	860	82800	41400	27600	20700	16580

NOTES:

1. MAXIMUM DISCHARGE CAPACITY, GPM (L/s) WITH APPROXIMATELY 1-3/4 INCH (44 mm) HEAD OF WATER AT THE DRAIN.
2. FOR RAINFALL RATES OTHER THAN THOSE LISTED, DETERMINE THE ALLOWABLE ROOF AREA BY DIVIDING THE AREA GIVEN IN THE 1 INCH PER HOUR (25.4 mm/h) COLUMN BY THE DESIRED RAINFALL RATE.
3. VERTICAL PIPING SHALL BE ROUND, SQUARE, OR RECTANGULAR.SQUARE PIPE SHALL BE SIZED TO ENCLOSED ITS EQUIVALENT ROUND PIPE.RECTANGULAR PIPE SHALL HAVE NOT LESS THAN THE SAME CROSS-SECTIONAL AREA AS ITS EQUIVALENT ROUND PIPE, EXCEPT THAT RATION OF ITS DIMENSIONS SHALL NOT EXCEED 3 TO 1.



3 P2.1 **PLUMBING ROOF PLAN**
SCALE: 3/16"=1'-0"

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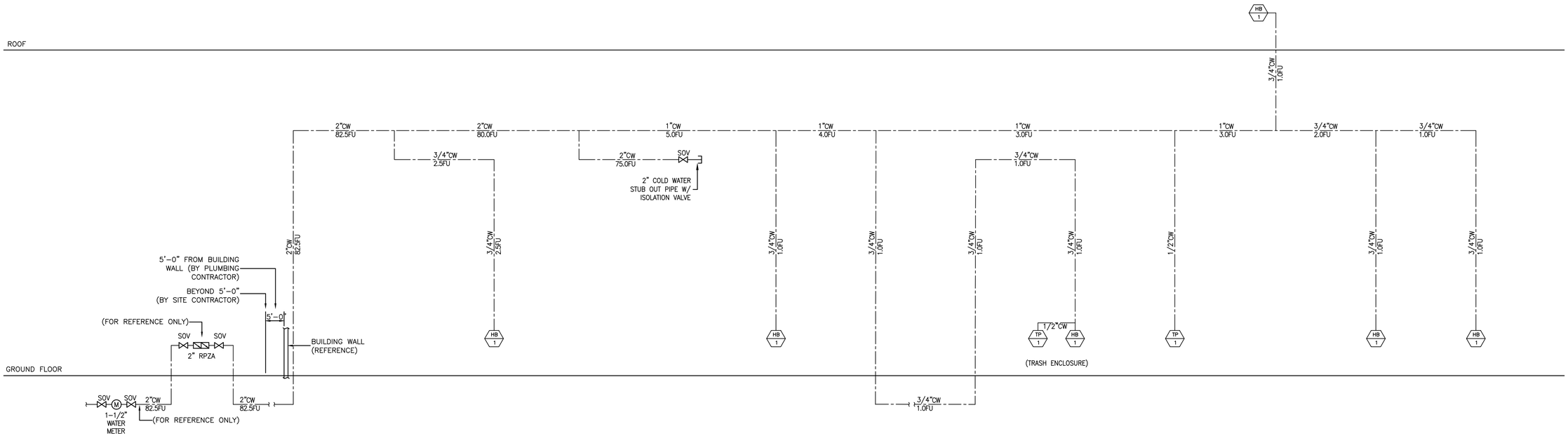
SHEET TITLE

PLUMBING LAYOUT AND ROOF PLAN

NO.	DATE	DESCRIPTION

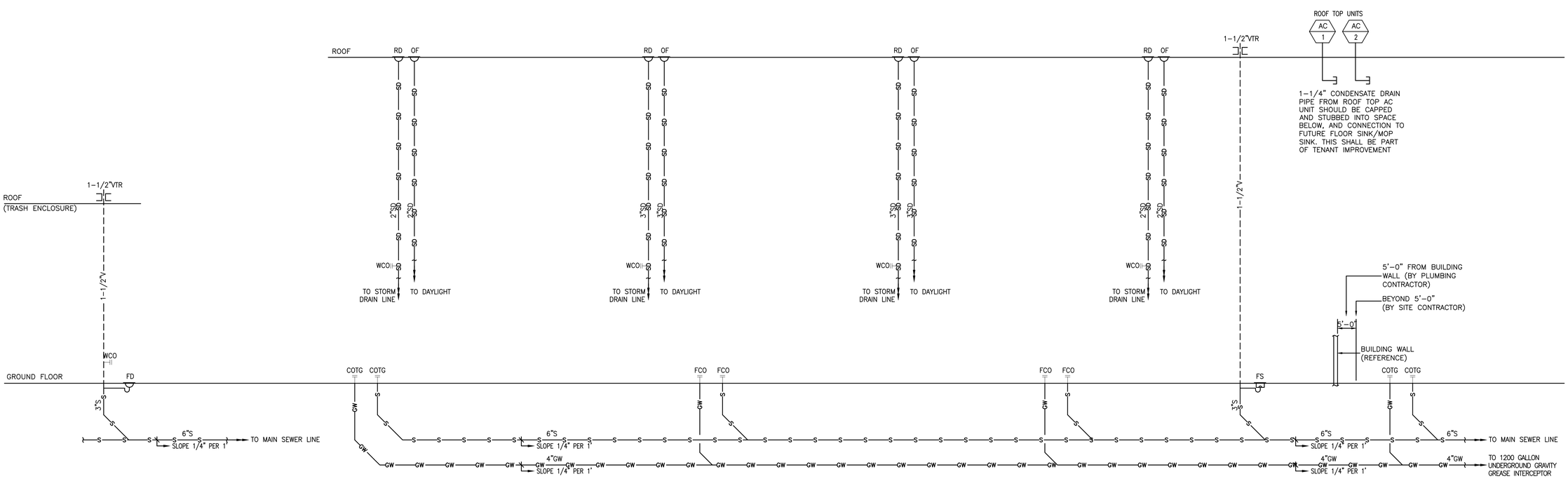
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P2.1



1 P3.1 DOMESTIC WATER DIAGRAM

NTS



2 P3.1 SEWER AND VENT DIAGRAM

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SHEET TITLE

PLUMBING SCHEMATIC DIAGRAM

NO.	DATE	DESCRIPTION

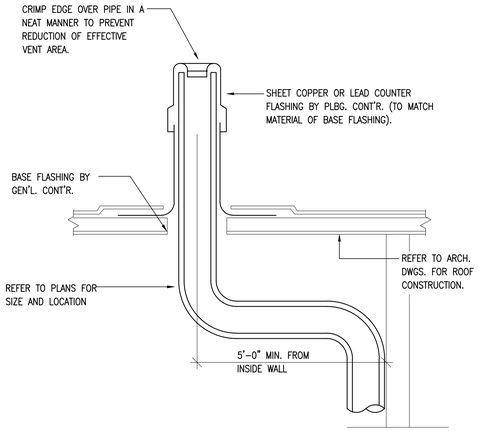
PROJECT #: A2306-AD441

DRAWN: LJT CHECKED: TP

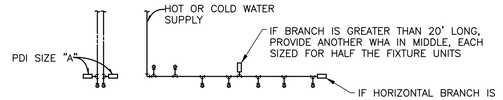
SCALE: AS SHOWN DATE: 12.04.2023

SHEET

P3.1



1 | SCALE: NONE | VENT THROUGH ROOF DETAIL



SINGLE FIXTURE

PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

MULTIPLE FIXTURES

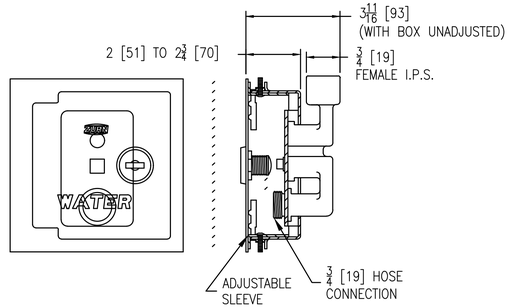
FIXTURE UNIT TABULATION

FIXTURE	COLD	HOT
VALVE WATER CLOSET	10	--
TANK WATER CLOSET	5	--
URINAL	5	--
LAVATORY/SINK	1.5	1.5
JANITOR'S SINK	3	3
SHOWER/BATHTUB	2	2

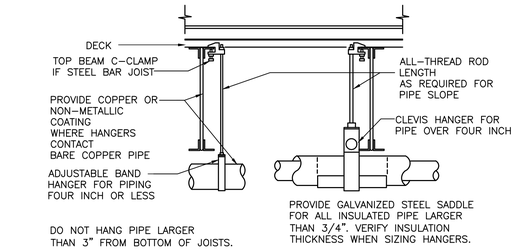
NOTES:

1. PROVIDE AIR CHAMBERS OR WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUIVALENT WITH PISTON AND O-RING CONSTRUCTION, HAVING PDI #WH-201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE.
2. INSTALL PER PDI STANDARDS AND MANUFACTURER'S INSTRUCTIONS.

2 | SCALE: NONE | WATER HAMMER ARRESTOR



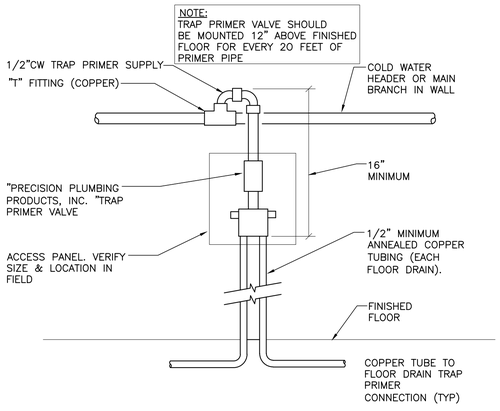
3 | SCALE: NONE | HOSE BIBB DETAIL



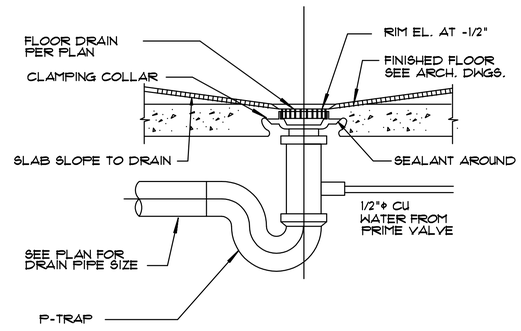
NOTES:

PROVIDE UPPER ATTACHMENT AS REQUIRED FOR CASES NOT SHOWN HERE. DO NOT INSTALL HANGER INSIDE INSULATION OR OTHERWISE PENETRATE VAPOR BARRIER. DO NOT HANG ONE PIPE FROM ANOTHER EXCEPT IN CHASES. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES. HANGER SPACING EXCEPT IN CHASES. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES. HANGER SPACING ONE NEAR ALL JOINT NOT SCALE. STEEL: 4"=14' 3"=12' 2-1/2"=11' 2"=10' 1-1/2"=9' 1"=7' 3/4"=6' 1/2"=5'. LOCATE BETWEEN JOISTS IF REQUIRED.LOCATE HANGERS TO TAKE LOAD OFF OF EQUIPMENT CONNECTIONS. DUE TO CHANGES IN WATER VELOCITY, ANCHOR WATER PIPE AGAINST SWAYING PROVIDE SEISMIC BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES. CHAINS OR PERFORATED STRAP IRON OR STEEL IS NOT ACCEPTABLE. REFER TO CODES FOR FURTHER INFORMATION. CONFORM TO MSS SP-58.

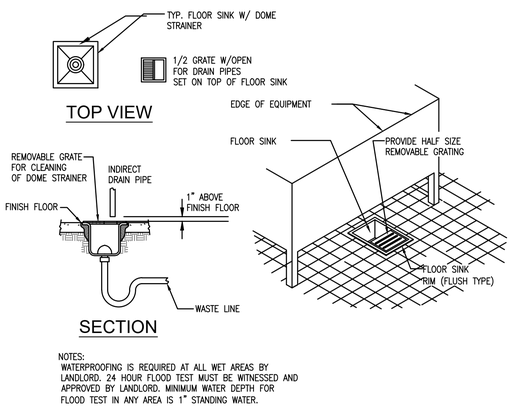
4 | SCALE: NONE | PIPE HANGER DETAIL



5 | SCALE: NONE | TRAP PRIMER DETAIL

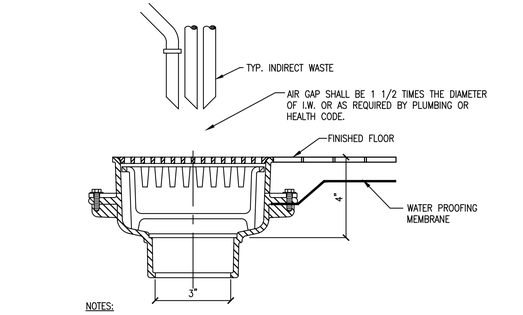


6 | SCALE: NONE | FLOOR DRAIN DETAIL



NOTES:
WATERPROOFING IS REQUIRED AT ALL WET AREAS BY LANDLORD. 24 HOUR FLOOD TEST MUST BE WITNESSED AND APPROVED BY LANDLORD. MINIMUM WATER DEPTH FOR FLOOD TEST IN ANY AREA IS 1" STANDING WATER.

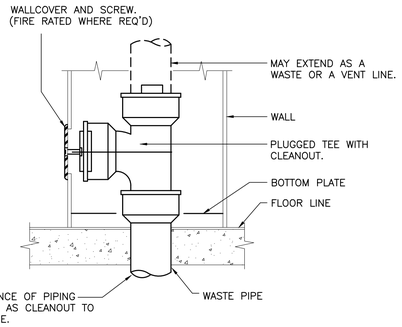
7 | SCALE: NONE | FLOOR SINK DETAIL



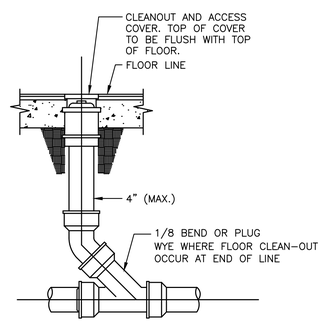
NOTES:

1. PLUMBING CONTRACTOR SHALL CONNECT I.W. TO OUTLET OF GRID STRAINER OR TAIL-PIECE FURNISHED BY KITCHEN EQUIPMENT CONTRACTOR.
2. SUPPORT I.W. FROM THE UNDERSIDE OF EQUIPMENT AS DIRECTED.

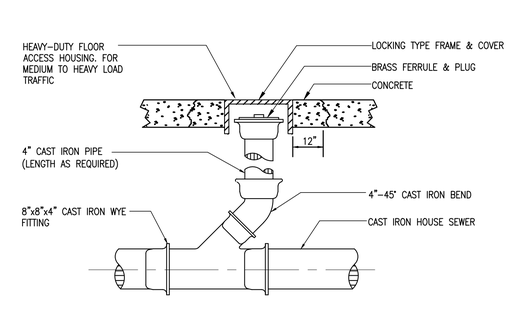
8 | SCALE: NONE | INDIRECT WASTE PIPING DETAIL



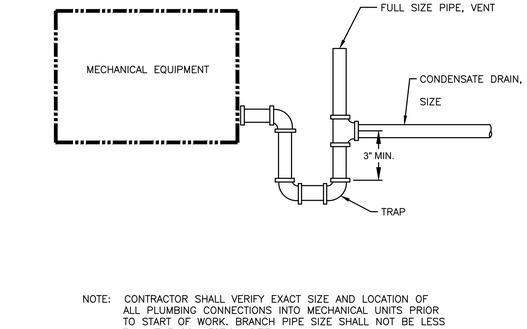
9 | SCALE: NONE | WALL CLEANOUT DETAIL



10 | SCALE: NONE | FLOOR CLEANOUT DETAIL



11 | SCALE: NONE | CLEANOUT TO GRADE DETAIL



NOTE: CONTRACTOR SHALL VERIFY EXACT SIZE AND LOCATION OF ALL PLUMBING CONNECTIONS INTO MECHANICAL UNITS PRIOR TO START OF WORK. BRANCH PIPE SIZE SHALL NOT BE LESS THAN THE CONNECTION SIZE.

12 | SCALE: NONE | CONDENSATE DRAIN TRAP DETAIL

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PROJECT #: A2306-AD441
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SCALE: AS SHOWN DATE: 12.04.2023

SHEET

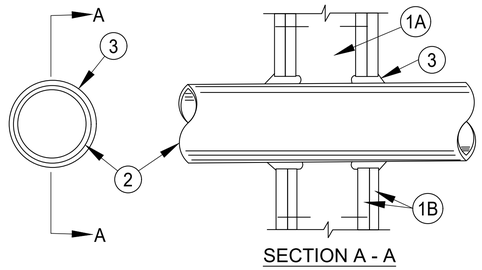
P4.1

THROUGH-PENETRATION FIRESTOP SYSTEM

ASSEMBLY USAGE DISCLAIMER

XHEZ – THROUGH–PENETRATION FIRESTOP SYSTEMS
SEE GENERAL INFORMATION FOR THROUGH–PENETRATION FIRESTOP SYSTEMS
SYSTEM NO. W–L–1001

F RATINGS — 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3) T RATINGS — 0, 1, 2, 3, AND 4 HR (SEE ITEM 3) L RATING AT AMBIENT — LESS THAN 1 CFM/SQ FT L RATING AT 400 F — LESS THAN 1 CFM/SQ FT



SECTION A - A

1. WALL ASSEMBLY — THE 1, 2, 3 OR 4 HR FIRE–RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS — WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 H FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM)OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3–5/8 IN. (92 MM) WIDE BY 1–3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.
   B. GYPSUM BOARD* — NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH–PENETRANT — ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN / (0 MM). (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

   A. STEEL PIPE — NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE — NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.
   C. CONDUIT — NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING
   D. COPPER TUBING — NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING
   E. COPPER PIPE — NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   F. THROUGH PENETRATING PRODUCT* — FLEXIBLE METAL PIPING THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

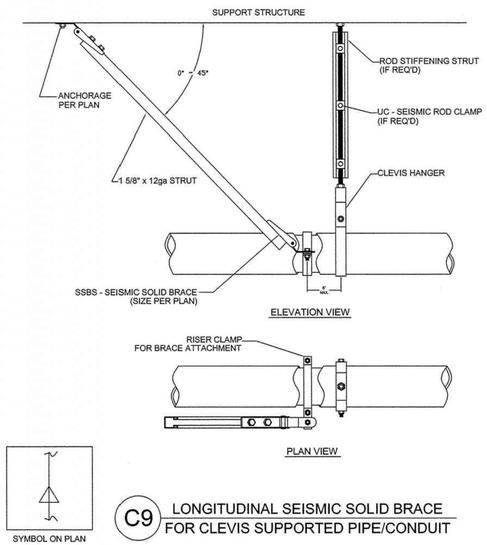
      1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. OMEGA FLEX INC
      2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. GASTITE, DIV OF TITEFLEX
      3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. WARD MFG L L C

3. FILL, VOID OR CAVITY MATERIAL* — CAULK OR SEALANT — MIN 5/8. , 1–1/4,1–7/8 AND 2–1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

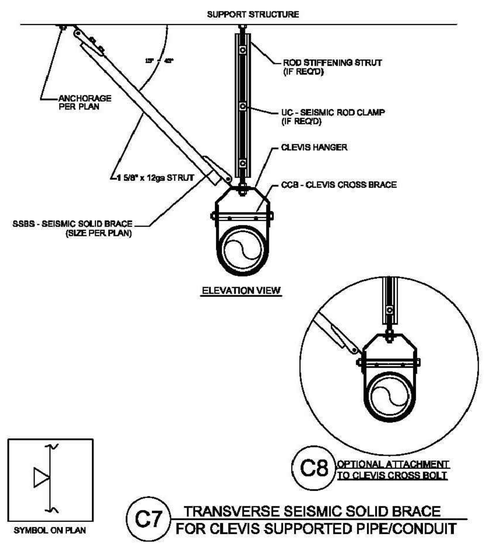
Max Pipe or Conduit Diam In (mm)	F Rating Hr	T Rating Hr
1 (25)	1 or 2 0+, 1 or 2	
1 (25)	3 or 4	3 or 4
4 (102)	1 or 2	0
6 (152)	3 or 4	0
12 (305)	1 or 2	0

+WHEN COPPER PIPE IS USED, T RATING IS 0 H. 3M COMPANY — CP 25WB+ OR FB–3000 WT.

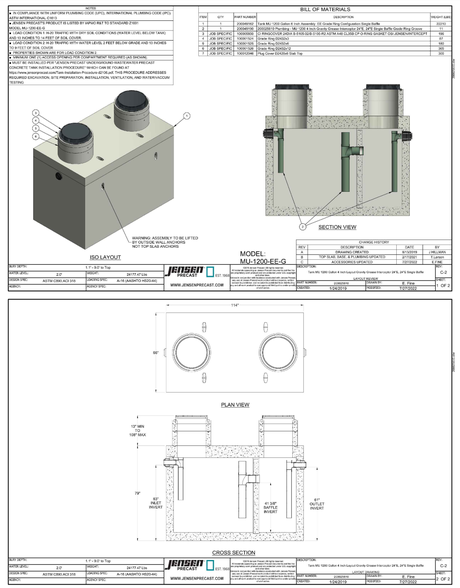
1 SCALE NONE — FIRESTOP PENETRATIONS DETAIL



2 SCALE NONE — LONGITUDINAL SEISMIC SOLID BRACE DETAIL



3 SCALE NONE — TRANSVERSE SEISMIC SOLID BRACE DETAIL



4 SCALE NONE — GRAVITY GREASE INTERCEPTOR DETAIL

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SHEET

P4.2

ELECTRICAL GENERAL NOTES

1. ALL WIRE TO BE THHN/THWN COPPER, STRANDED EXCEPT WHERE NOTED OTHERWISE.
2. ALL DEVICES AND EQUIPMENT INSTALLED OUTDOORS OR EXPOSED TO THE WEATHER SHALL BE OF WEATHERPROOF CONSTRUCTION.
3. ALL DEVICES SHALL BE SPECIFICATION GRADE IN COMMON AREAS. ALL SINGLE AND GANGED PLATES SHALL BE THERMOPLASTIC AND SHALL MATCH THE DEVICE IN COLOR. COORDINATE DEVICE COLOR WITH THE ARCHITECT PRIOR TO INSTALLATION. GANG DEVICES AT GROUP LOCATIONS UNDER A SINGLE COVER PLATE.
4. THE ELECTRICAL PLANS ARE SCHEMATIC IN NATURE AND ARE NOT INTENDED TO SHOW ALL OF THE ARCHITECTURAL DETAIL OR SPECIFICS OF ELECTRICAL CONSTRUCTION. TAKE ALL DIMENSIONS FROM THE ARCHITECTURAL DRAWINGS.
5. REFER TO THE 2022 EDITIONS OF THE CEC, TITLE 24, CBC AND LOCAL ORDINANCES IN EFFECT AT THE TIME OF CONSTRUCTION AS THE CONTROLLING DOCUMENTS.
6. ALL CONNECTIONS TO MECHANICAL EQUIPMENT SHALL BE MADE WITH A MINIMUM OF 24" OF WEATHERPROOF FLEXIBLE CONDUIT TO PREVENT SOUND AND VIBRATION TRANSMISSION TO THE STRUCTURE.
7. COORDINATE ALL MOTOR OVERLOADS AND/OR FUSES FURNISHED BY THIS CONTRACT WITH THE ACTUAL EQUIPMENT INSTALLED. SIZE OVERLOADS BASED ON MOTOR NAMEPLATE FULL LOAD CURRENT AND SERVICE FACTOR. FUSES FOR MOTOR AND TRANSFORMER CIRCUITS SHALL BE DUAL ELEMENT. FUSES FOR OTHER "NON-INRUSH" LOADS SHALL BE FAST ACTING. ALL FUSES SHALL BE CURRENT LIMITING CLASS RK5 OR CLASS L UNLESS OTHERWISE NOTED.
8. GROUNDING CONDUCTORS ARE GENERALLY NOT SHOWN. GROUND AND BOND ALL EQUIPMENT, RACEWAYS, MOTORS, PANELBOARDS AND SWITCHBOARDS, ETC. IN ACCORDANCE WITH CEC ARTICLE 250.
9. BONDING OF ALL INTERIOR METAL PIPING SHALL BE IN ACCORDANCE WITH ARTICLE 250.144 AS FOLLOWS:
   A. ALL INTERIOR METAL WATER PIPING SHALL BE BONDED TO ONE OR MORE GROUNDING ELECTRODES USED. THE BONDING JUMPER SHALL BE SIZED IN ACCORDANCE WITH TABLE 250.66.
   B. INTERIOR METAL PIPING THAT MAY BECOME ENERGIZED (i.e. GAS PIPING, ETC.), SHALL BE BONDED IN ACCORDANCE WITH PG&E REQUIREMENTS. THE BONDING JUMPER SHALL BE SIZED IN ACCORDANCE WITH TABLE 250.66, USING THE RATING OF THE CIRCUIT THAT MAY ENERGIZE THE PIPING.
10. THE PHASE COLOR CODING OF THE INSULATION OF THE CONDUCTORS SHALL BE:

NOMINAL VOLTAGE	A	B	C	NEUTRAL	GROUND
120/208V	BLACK	RED	BLUE	WHITE	GREEN

11. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2022 EDITION OF CALIFORNIA ELECTRICAL CODE.
12. EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. CEC 210.4(B)
13. ALL UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT SHALL BE GROUPED BY WIRE TIES OR SIMILAR MEANS IN AT LEAST ONE LOCATION WITHIN THE PANELBOARD OR OTHER POINT OF ORIGINATION. CEC 210.4(D)
14. ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2022 EDITION OF CALIFORNIA BUILDING ENERGY EFFICIENCY STANDARDS.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	GEN	GENERATOR	PB	PULL BOX
AL	ALUMINUM CONDUCTOR OR BUS	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PE	PHOTO ELECTRIC CELL
AM	AMMETER	GND	GROUND	PNL	PANEL
ANN	ANNUNCIATING			PR	PAIR
ART	ARTICLE	HGT	HEIGHT		
AUTO	AUTOMATIC	HP	HORSE POWER	QTY	QUANTITY
AUX	AUXILIARY	HPS	HIGH PRESSURE SODIUM		
AWG	AMERICAN WIRE GAUGE	HTR	HEATER	R	REMOVE OR RELOCATE
		HW	HOT WATER	REC	RECEPTACLE
BD	BOARD			RECEPT	RECEPTACLE
BKBD	BACK BOARD	IG	ISOLATED GROUND	REF	REFRIGERATOR; REFERENCE
BKR	BREAKER	INCAND	INCANDESCENT	REQ'D	REQUIRED
BTM	BOTTOM			RL	RELOCATED
		JB	JUNCTION BOX		
CAB	CABINET			SCHED	SCHEDULE
CB	CIRCUIT BREAKER	KV	KILOVOLT	SECT	SECTION
CBC	CALIFORNIA BUILDING CODE	KVA	KILOVOLT AMPERE	SIM	SIMILAR
CCTV	CLOSED CIRCUIT TELEVISION	KW	KILOWATT	SQ	SQUARE
CEC	CALIFORNIA ELECTRICAL CODE			SW	SWITCH
CKT	CIRCUIT	LT	LIGHT	SWBD	SWITCHBOARD
CO	CONDUIT ONLY	LTG	LIGHTING	SWGR	SWITCHGEAR
CU	COPPER CONDUCTOR OR BUS			SYS	SYSTEM
		MAX	MAXIMUM		
DD	DUCT DETECTOR	MCB	MAIN CIRCUIT BREAKER	TBD	TO BE DETERMINED
DIA	DIAMETER	MCC	MOTOR CONTROL CENTER	TC	TIME CLOCK
DIM	DIMENSION	MCM	MILLI CIRCULAR MILS	TEL	TELEPHONE
DISC	DISCONNECT	MIN	MINIMUM	TEMP	TEMPORARY; TEMPERATURE
DN	DOWN	MISC	MISCELLANEOUS	TI	TENANT IMPROVEMENT
DS	DISCONNECT SWITCH	MLO	MAIN LUG ONLY	TRANS	TRANSFORMER
		MTD	MOUNTED	TTB	TELEPHONE TERMINAL BACKBOARD
(E)	EXISTING	MTG	MOUNTING	TV	TELEVISION
(ER)	EXISTING TO REMAIN	MTR	MOTOR	TYP	TYPICAL
EA	EACH				
EC	ELECTRICAL CONTRACTOR	N	NORTH	UC	UNDER CABINET
EM	EMERGENCY	NC	NORMALLY CLOSED	UG	UNDERGROUND
EQ	EQUAL	NEC	NATIONAL ELECTRIC CODE	UL	UNDERWRITERS LABORATORY
EQUIP	EQUIPMENT	NEUT	NEUTRAL	UON	UNLESS OTHERWISE NOTED
EX	EXPLOSION PROOF	NIC	NOT IN CONTRACT	V	VOLT
EXH	EXHAUST	NO	NORMALLY OPEN	W	WALL MOUNTED; WATT
		NTS	NOT TO SCALE	W/	WITH
FA	FIRE ALARM			W/O	WITH OUT
FAAP	FIRE ALARM ANNUNCIATING PANEL	OL	OVERLOAD	WP	WEATHER PROOF
FACP	FIRE ALARM CONTROL PANEL	OS	OCCUPANCY SENSOR	XFMR	TRANSFORMER
FBO	FURNISHED BY OTHERS				
FIN	FINISH				
FLA	FULL LOAD AMPS				
FSD	FIRE SMOKE DAMPER				
FUT	FUTURE				

ELECTRICAL LEGEND
(ALL SYMBOLS MAY OR MAY NOT BE USED)

LIGHTING

- 2X4 RECESSED FLUORESCENT/LED TANDEM WIRED
- 2X4 SINGLE RECESSED FLUORESCENT/LED
- 4-FT FLUORESCENT/LED FIXTURE, SURFACE OR RECESSED MOUNTED.
- 4-FT FLUORESCENT/LED INDUSTRIAL STRIP LIGHT
- 4-FT FLUORESCENT/LED INDUSTRIAL STRIP LIGHT WITH BATTERY PACK ON NIGHT LIGHT OR EMERGENCY CIRCUIT
- 8-FT FLUORESCENT/LED INDUSTRIAL STRIP LIGHT
- 8-FT FLUORESCENT/LED INDUSTRIAL STRIP LIGHT
- 8-FT FLUORESCENT/LED INDUSTRIAL STRIP LIGHT WITH BATTERY PACK ON NIGHT LIGHT OR EMERGENCY CIRCUIT
- FLUORESCENT/LED OR INCANDESCENT DOWN LIGHT
- WALL WASHER TYPE FIXTURE. DIRECTION AS INDICATED ON MARK-UP
- WALL MOUNTED LIGHT FIXTURE
- WALL SCONCE ON NORMAL SOURCE CIRCUIT. SHADE FOR EMERGENCY CIRCUIT
- CEILING OR WALL MOUNTED EXIT SIGN "▲" INDICATES INTEGRAL EMERGENCY HEAD
- CEILING OR WALL MOUNTED EXIT SIGN. ARROWS INDICATE PATH OF EGRESS.
- NEW EMERGENCY LIGHTING WITH BATTERY BACK-UP. 90 MIN BATTERY (E) = EXISTING
- S_a SPST TOGGLE SWITCH – 20A, 120/277V, "a" INDICATES CONTROL.
- ^3S_a 3-WAY TOGGLE SWITCH – 20A, 120/277V "a" INDICATES CONTROL.
- S_K SPST KEYED SWITCH – 20A, 120/277V, "a" INDICATES CONTROL.
- S_{R1} MOMENTARY CONTACT SWITCH. SINGLE POLE, DOUBLE THROW U.O.N. LOW VOLTAGE OVERRIDE SWITCH "R1" –RELAY CONTROLLED.
- S_T MANUAL MOTOR STARTER SWITCH WITH INTEGRAL OVERLOAD HEATERS.
- S_{PL} WALL SWITCH WITH INTEGRAL NEON PILOT LIGHT.
- S_{CB} (2) SINGLE POLE SWITCHES
- INCANDESCENT DIMMER SWITCH. ALSO USED A FLUORESCENT DIMMER "F"; AND AS A LOW VOLTAGE DIMMER "L" (0-10V)
- ^{3} "3" INDICATES 3-WAY SWITCH CONTROL
- WALL MOUNTED MOTION SENSOR PASSIVE INFRARED TYPE
  "1" – SINGLE LEVEL LIGHTING WATTSTOPPER MDL NO. PW-100 120V 800W OR EQUAL
  "2" – DUAL LEVEL LIGHTING OR TWO LOADS WATTSTOPPER MDL NO. PW-200 120V 800W OR EQUAL
- WALL MOUNTED MOTION SENSOR ULTRASONIC TYPE
  "1" – SINGLE LEVEL LIGHTING WATTSTOPPER MDL NO. UW-100 120V 800W OR EQUAL
  "2" – DUAL LEVEL LIGHTING OR TWO LOADS WATTSTOPPER MDL NO. UW-200 120V 800W OR EQUAL
- WALL MOUNTED MOTION SENSOR/DIMMER COMBINATION
  "1" – SINGLE LEVEL LIGHTING
  "2" – DUAL LEVEL LIGHTING OR TWO LOADS
  INCANDESCENT DIMMER SWITCH "D" ; FLUORESCENT DIMMER "F"; AND AS A LOW VOLTAGE DIMMER (0-10V) "L".
- WALL MOUNTED MOMENTARY CONTACT LOW VOLTAGE OVERRIDE SWITCH
  "1" – CONTROLS RELAY #1
- CEILING MOUNTED MOTION SENSOR
- CEILING MOUNTED DAYLIGHT SENSOR
- CEILING MOUNTED SMOKE DETECTOR
- THERMOSTAT
- CEILING MOUNTED CARBON MONOXIDE DETECTOR
- CEILING MOUNTED HEAT DETECTOR
- TC TIME CLOCK
- NURSE CALL DEVICE
- DRP DIMMING RELAY POWER PACK (0-10V DIMMING) LUTRON, nLIGHT/ACUITY, LEVITON, WATTSTOPPER POWER PACK, OR EQUIVALENT
- PP RELAY POWER PACK FOR PLUG LOADS LUTRON, nLIGHT/ACUITY, LEVITON, WATTSTOPPER OR EQUIVALENT

POWER

- FLUSH MOUNTED BRANCH CIRCUIT PANEL
- SURFACE MOUNTED BRANCH CIRCUIT PANEL
- SWITCHBOARD OR DISTRIBUTION BOARD
- COMBINATION STARTER DISCONNECT SWITCH DISCONNECT SWITCH
- F DISCONNECT SWITCH, MOTOR RATED,"F" INDICATES SWITCH TO BE FURNISHED WITH FUSES SIZE TO EQUIPMENT NAMEPLATE DATA.
- 2 MAGNETIC MOTOR STARTER WITH CPT, HOA AND 3 OL's. '2' INDICATES NEMA SIZE.
- EMERGENCY POWER OFF (PANIC BUTTON)
- M F AND MOTOR, FURNISHED AND INSTALLED BY OTHERS. 'M' DENOTES HORSEPOWER WHEN KNOWN.
- ABOVE CEILING OR CEILING MOUNTED JUNCTION BOX
- WIREMOLD G-4000 DIVIDED. VERIFY MOUNTING HEIGHT AND BRANCH CIRCUIT CONDUIT ROUTING.
- DUPLEX RECEPTACLE MOUNTED ON CEILING
- QUADRUPLEX RECEPTACLE MOUNTED ON CEILING
- DUPLEX RECEPTACLE MOUNTED ON WALL
- QUADRUPLEX RECEPTACLE MOUNTED ON WALL
- DUPLEX RECEPTACLE ON A DEDICATED CIRCUIT
- QUADRUPLEX RECEPTACLE ON A DEDICATED CIRCUIT
- HALF SWITCHED DUPLEX RECEPTACLE
- QUADRUPLEX CONTROLLED/UNCONTROLLED RECEPTACLE
- CONTROLLED DUPLEX RECEPTACLE
- 208V, 60A RECEPTACLE, NEMA CONFIGURATION TO BE VERIFIED WITH OWNER, U.O.N.
- 208V, 50A RECEPTACLE, NEMA CONFIGURATION TO BE VERIFIED WITH OWNER, U.O.N.
- 208V, 20A RECEPTACLE, NEMA TYPE RECEPTACLE TO BE VERIFIED WITH OWNER, U.O.N.
- 120V, 15A RECEPTACLE, NEMA TYPE RECEPTACLE TO BE VERIFIED WITH OWNER, U.O.N.
- 208V, 1ø RECEPTACLE NEMA TYPE RECEPTACLE TO BE VERIFIED WITH OWNER, U.O.N.
- POWER POLES
- CORD DROP RECEPTACLE
- CATV OUTLET
- HOME NETWORK OUTLET FOR TV, PHONE, DATA
- ISOLATED GROUND DUPLEX RECEPTACLE
- ISOLATED GROUND QUADRUPLEX RECEPTACLE
- DOOR BELL
- ELEVATOR PIT DUPLEX RECEPTACLE, LIGHT AND SWITCH
- FLUSH FLOOR DUPLEX RECEPTACLE
- FLUSH FLOOR QUADRUPLEX RECEPTACLE
- FLUSH FLOOR TELEPHONE OUTLET
- FLUSH FLOOR COMBINATION TELEPHONE/DATA OUTLET
- FLUSH FLOOR RECEPTACLE AND TELEPHONE BOX
- DATA OUTLET
- TELEPHONE OUTLET +18" AFF UON
- COMBINATION TELEPHONE & DATA OUTLET
- IC INTERCOM OUTLET +18" AFF UON

CONDUIT

- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- CONDUIT RUNNING UP & DOWN
- LV LOW VOLTAGE MULTI-CONDUCTOR CABLE – PLENUM RATED WHERE REQUIRED, NOT INSTALLED IN CONDUIT.
- CONDUIT – CONCEALED IN WALLS OR CEILING IF POSSIBLE, 1/2" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- CONDUIT – IN OR BELOW FLOOR, 3/4" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- CONDUIT – EXPOSED, 1/2" WITH (2) #12 THHN/THWN Cu & (1) #12 THHN/THWN Cu GROUND U.O.N.
- TYPE MC CABLE 3/C #12 WITH GND (MINIMUM NUMBER OF CONDUCTOR AND WIRE SIZE)
- UG CONDUIT INSTALLED UNDERGROUND
- HASH MARK IDENTIFICATION
- EQUIPMENT GROUND CONDUCTOR
- ISOLATED GROUND CONDUCTOR (WHERE USED)
- NEUTRAL CONDUCTOR
- #10 CONDUIT – HOME RUN TO PANEL, TERMINAL CABINET, ETC., HASH MARKS INDICATE NUMBER OF WIRES. "#10" INDICATES WIRE SIZE. SIZE CONDUIT PER CODE U.O.N.
- FLEX CONDUIT WITH CONNECTION.

NOTE: PROVIDE DEDICATED NEUTRAL TO EACH BRANCH CIRCUIT WIRING.

MISC.

- AC-1 EQUIPMENT TAG
- 1 SHEET NOTE SYMBOL
- 1 GENERAL NOTE SYMBOL
- A 2 FIXTURE TAG, NUMBER INDICATED QUANTITY OF FIXTURES
- 1 REVISION REFERENCE SYMBOL – SEE ASSOCIATED REVISION NOTE.
- F1 FEEDER DESIGNATION

SINGLE LINE

- 150/100 (3) MOLDED CASE CIRCUIT BREAKER, "100" EQUALS TRIP RATING, "3" INDICATES NUMBER OF POLES, "150" EQUALS FRAME SIZE.
- 100A/3P ENCLOSED MOLDED CASE CIRCUIT BREAKER,"100" EQUALS TRIP RATING "3P" INDICATES NUMBER OF POLES.
- DRAWOUT INSULATED CASE OR AIR CIRCUIT BREAKER WITH INDICATIONS ABOVE.
- GF TP EQUIPMENT GROUND FAULT DETECTION WITH TEST/MONITOR PANEL.
- 100/70 (3) FUSED SWITCH, CLASS L OR R FUSES AS NOTED. "100" INDICATES SWITCH SIZE, "70" INDICATES FUSE SIZE, "3" INDICATES POLES.
- TRANSFORMER, 2 WINDING
  Δ – DELTA
  Y – WYE
  Y – WYE GROUNDED NEUTRAL
- 100/3 PANELBOARD, SIZE AS NOTED, MAIN LUGS ONLY UNLESS MAIN BREAKER SHOWN, "100/3" INDICATES MAIN BREAKER SIZE.
- MCP 2 OL COMBINATION STARTER, "2" INDICATES STANDARD NEMA SIZE WITH CPT, HOA AND 3 OVERLOADS U.O.N.
- M KW-HR METER

SCOPE OF WORK

1. PROVIDE TITLE 24 FOR INTERIOR LIGHTING AND OUTDOOR LIGHTING
2. PROVIDE RECEPTACLE AND SIGNAL SYSTEM
3. PROVIDE LIGHTING AND CONTROL SWITCHES SYSTEM
4. PROVIDE POWER SUPPLY FOR MECHANICAL EQUIPMENT
5. PROVIDE ONE-LINE DIAGRAM, PANEL SCHEDULE, DETAILS AND SPECIFICATIONS

DRAWING INDEX

E1.0	ELECTRICAL GENERAL NOTES, LEGEND & SYMBOLS
E1.0	ELECTRICAL SITE PLAN
E2.0	ELECTRICAL TITLE 24 INTERIOR PART 1
E2.1	ELECTRICAL TITLE 24 INTERIOR PART 2
E2.2	ELECTRICAL TITLE 24 EXTERIOR PART 1
E2.3	ELECTRICAL TITLE 24 EXTERIOR PART 2
E3.0	ELECTRICAL POWER AND ROOF PLAN
E4.0	ELECTRICAL LIGHTING PLAN
E5.0	ELECTRICAL SINGLE LINE DIAGRAM, LOAD CALCULATION AND PANEL SCHEDULE
E6.0	ELECTRICAL DETAILS
E7.0	ELECTRICAL SPECIFICATIONS

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SHEET TITLE

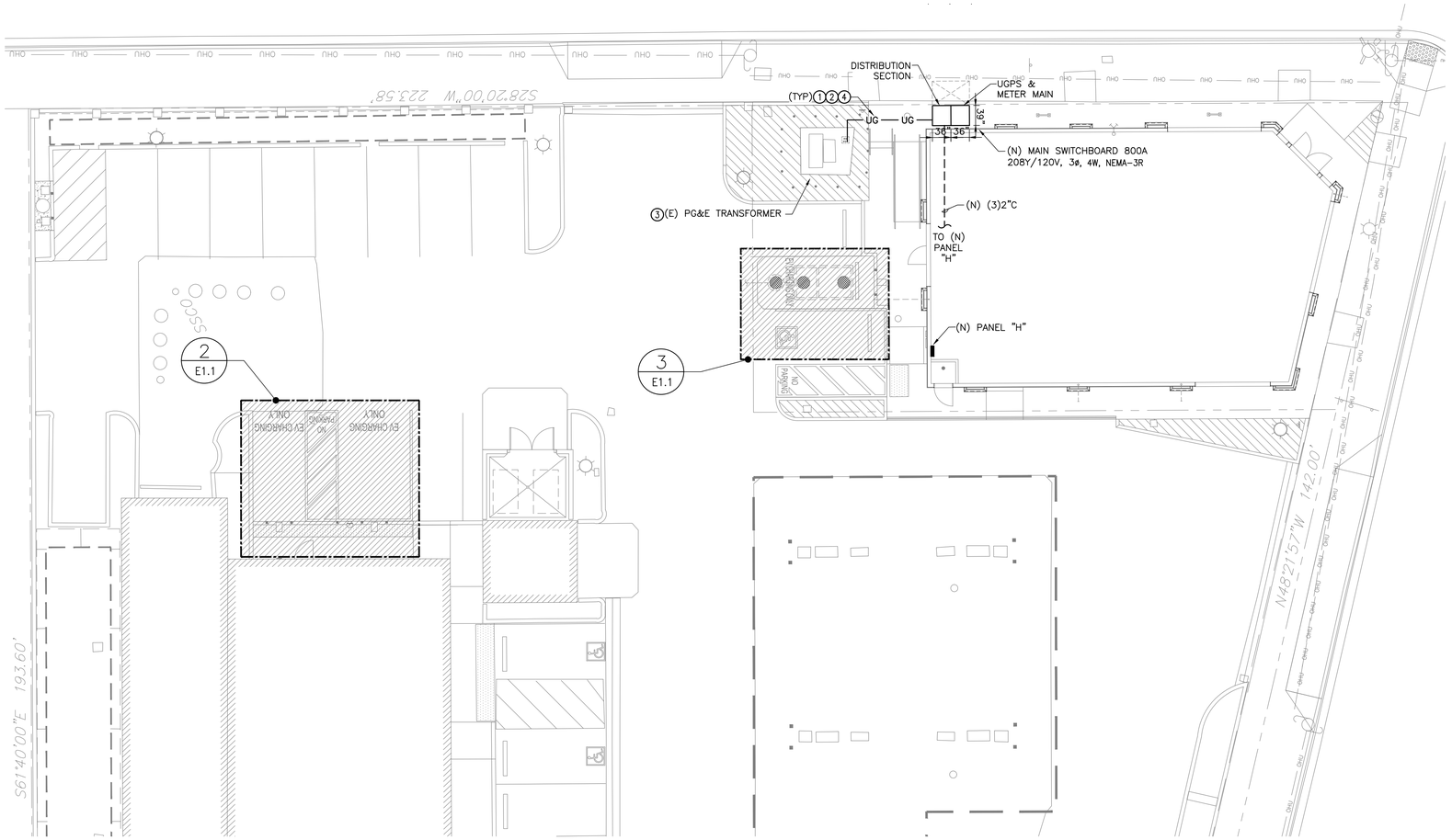
ELECTRICAL GENERAL NOTES, LEGEND & SYMBOLS

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E1.0



1 ELECTRICAL SITE PLAN

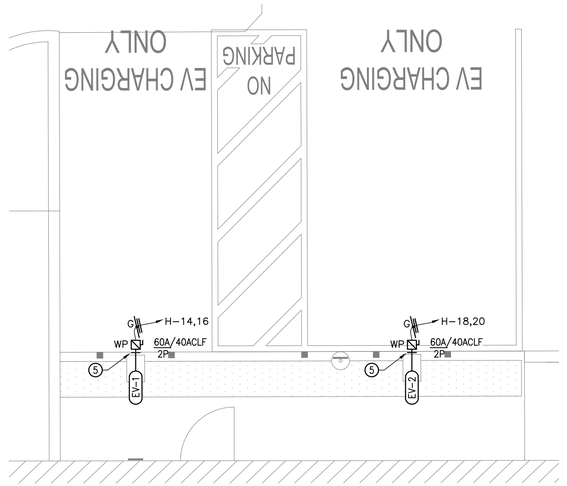
1/E1.1 SCALE: 3/32"=1'-0"

GENERAL NOTES:

1. ELECTRICAL SITE PLAN IS SCHEMATIC IN NATURE. CONTRACTOR SHALL COORDINATE WITH THE OWNER/ARCHITECT, UTILITY COMPANY, AND VERIFY THE SITE PRIOR TO INSTALLATION OF ALL ELECTRICAL EQUIPMENT.
2. ELECTRICAL PLANS ARE INTENDED TO SHOW, IN A GENERAL WAY, THE APPROXIMATE LOCATION AND LOADS OF THE INTENDED FIXTURE AND EQUIPMENT. EXACT LOCATIONS AND MATERIALS SHALL BE DETERMINED IN THE FIELD BY THE INSTALLING CONTRACTOR AND SHALL CONFORM TO THE PROVISIONS AS SET FORTH IN THE LATEST EDITION OF THE CALIFORNIA MECHANICAL, PLUMBING AND ELECTRICAL CODE, 2022 EDITION OF THE CALIFORNIA ENERGY CODE, AND CALIFORNIA GREEN BUILDING CODE.

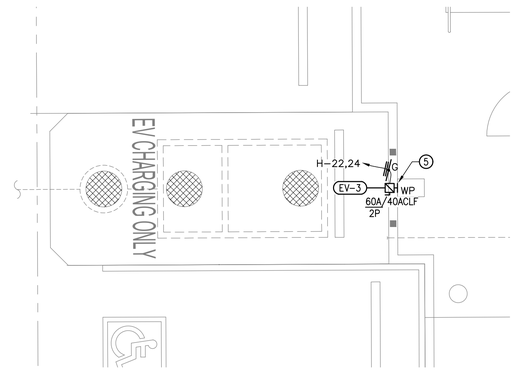
SHEET NOTES:

1. ALL UNDERGROUND CONDUIT MUST BE PVC SCHEDULE 40 FOR UNDERGROUND CONDUIT WITH RIGID PVC COATED ON ALL ELBOWS TERMINATED TO BOTTOM OF SWITCHBOARD AND TRANSFORMER.
2. ALL EXTERIOR CONDUIT EXPOSED TO WEATHER SHALL BE RIGID PVC COATED.
3. EXISTING PG&E TRANSFORMER. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH PG&E TO DETERMINE IF EXISTING TRANSFORMER IS ENOUGH FOR SUPPLYING THE NEW AND EXISTING BUILDINGS.
4. UNDERGROUND FEEDER ROUTES SHOWN ARE DIAGRAMMATIC ONLY. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY AND MAP-OUT ROUTING TO SUIT ACTUAL FIELD CONDITION. COORDINATE WITH OTHER TRADE PRIOR TO INSTALLATION.
5. PROVIDE WEATHERPROOF DISCONNECT SWITCH FOR EV CHARGER. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.
6. CONDUIT AND FEEDER SIZE FOR EV CHARGER MAY CHANGE BASED ON THE SPECIFICATIONS PROVIDED BY OWNER. COORDINATE ALL WORKS WITH OWNER AND EQUIPMENT VENDOR PRIOR TO INSTALLATION.



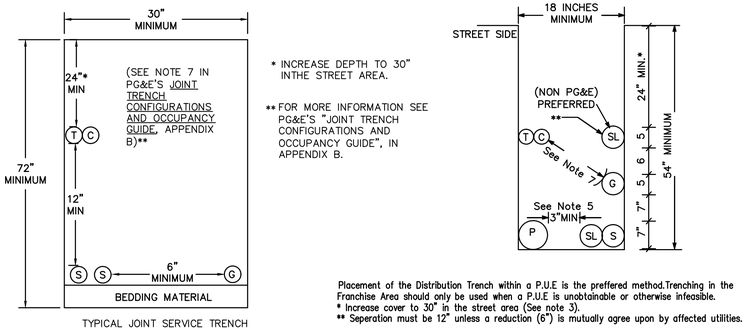
2 ENLARGED PLAN

2/E1.1 SCALE: 1/4"=1'-0"



3 ENLARGED PLAN

3/E1.1 SCALE: 1/4"=1'-0"



TYPICAL JOINT SERVICE TRENCH

* INCREASE DEPTH TO 30" INTHE STREET AREA.

** FOR MORE INFORMATION SEE PG&E'S "JOINT TRENCH CONFIGURATIONS AND OCCUPANCY GUIDE", IN APPENDIX B.

Placement of the Distribution Trench within a P.U.E is the preffered method.Trenching in the Franchise Area should only be used when a P.U.E is unobtainable or otherwise infeasible.
* Increase cover to 30" in the street area (See note 3).
** Seperation must be 12" unless a reduction (6") is mutually agree upon by affected utilities.

TABLE 3-1 MINIMUM SEPARATION AND CLEARANCE REQUIREMENTS FOR SERVICE TRENCHES

		G	DUCT T	DB T	C	S	P
		(ALL NUMBERS IN INCHES)					
G	(GAS) SEE NOTES 4,7 AND 13(1)	–	12	12	12	6	12
T	(TELEPHONE) DUCT	12	–	1	1	12	12
T	(TELEPHONE) DIRECT BURY	12	1	–	1	12	12
C	(CATV)	12	1	1	–	12	12
S	(ELECTRIC SECONDARY)	6	12	12	12	1.5	3
P	(ELECTRIC PRIMARY)	12	12	12	12	3	3
SL	(STREETLIGHT) SEE NOTE 2 BELOW	6	12	12	12	1.5	3

(1) FOR MORE INFORMATION CONCERNING TABLE 3-1, SEE PG&E'S "JOINT TRENCH CONFIGURATIONS AND OCCUPANCY GUIDE", IN APPENDIX B.

(2) STREET LIGHT CIRCUITS NOT OWNED BY PG&E MUST BE INSTALLED TO MEET THE REQUIREMENTS OF PG&E'S "JOINT TRENCH CONFIGURATIONS AND OCCUPANCY GUIDE", AS IT APPLIES TO A SECOND ELECTRIC UTILITY. CONTACT PG&E FOR THE REQUIREMENTS AND REFER TO PG&E'S "JOINT TRENCH CONFIGURATIONS AND OCCUPANCY GUIDE" IN APPENDIX B.

4 PG&E DISTRIBUTION & SERVICE TRENCH DETAIL

4/E1.1 SCALE: NO SCALE

EQUIPMENT SCHEDULE (6)

CODE	QTY.	DESCRIPTION	MANUFACTURER	MODEL NO.	VOLTAGE	PHASE	AMPS	VA	TYPE OF CONNECTION	FEEDER
EV-1	1	ELECTRIC VEHICLE SUPPLY EQUIPMENT	CHARGEPOINT	CT4011-GW1	208	1	30.0	6240	DISCONNECT SWITCH	1"C(2)#6 AWG & (1)#10GND
EV-2	1	ELECTRIC VEHICLE SUPPLY EQUIPMENT	CHARGEPOINT	CT4011-GW1	208	1	30.0	6240	DISCONNECT SWITCH	1"C(2)#6 AWG & (1)#10GND
EV-3	1	ELECTRIC VEHICLE SUPPLY EQUIPMENT	CHARGEPOINT	CT4011-GW1	208	1	30.0	6240	DISCONNECT SWITCH	1"C(2)#8 AWG & (1)#10GND

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SHEET TITLE

ELECTRICAL SITE PLAN

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E1.1

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE — **NRCC-LTI-E**

This document is used to demonstrate compliance with requirements in 110.9, 110.12(c), 130.0, 130.1, 140.6 and 141.0(b)2 for indoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e) and 180.2(b)4 for indoor lighting scopes using the prescriptive path for multifamily occupancies. Multifamily includes dormitory and senior living facilities.

Project Name: RETAIL BUILDING	**Report Page:** (Page 1 of 7)
Project Address: 2219 EL CAMINO REAL, REDWOOD CITY, CA 94063	**Date Prepared:** 2023-06-13T01:11:23-04:00

A. GENERAL INFORMATION

01	Project Location (city)	REDWOOD	04	Total Conditioned Floor Area (ft²)	2,644
02	Climate Zone	3	05	Total Unconditioned Floor Area (ft²)	0
03	Occupancy Types Within Project (select all that apply):		06	# of Stories (Habitable Above Grade)	0
● Retail					

B. PROJECT SCOPE

This table includes any lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.6 / 170.2(e) or 141.0(b)2 / 180.2(b)4 for alterations.

Scope of Work	Conditioned Spaces		Unconditioned Spaces	
01	02	03	04	05
My Project Consists of (check all that apply):	Calculation Method	Area (ft²)	Calculation Method	Area (ft²)
☒ New Lighting System	Area Category Method	2644	N/A	0
☐ New Lighting System - Parking Garage	N/A	0	N/A	0
Total Area of Work (ft²)	2644			

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE — NRCC-LTI-E

Project Name: RETAIL BUILDING	**Report Page:** (Page 2 of 7)
	Date Prepared: 2023-06-13T01:11:23-04:00

C. COMPLIANCE RESULTS

If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

Lighting in conditioned and unconditioned spaces must not be combined for compliance per 140.6(b)1 / 170.2(e)	Allowed Lighting Power per 140.6(b) / 170.2(e) (Watts)						Adjusted Lighting Power per 140.6(a) / 170.2(e) (Watts)				Compliance Results
	01	02	03	04	05		06	07	08		09
	Complete Building 140.6(c)1	Area Category 140.6(c)2 / 170.2(e)4	Area Category Additional 140.6(c)2G / 170.2(e)4Av (+)	Tailored 140.6(c)3 / 170.2(e)4B (+)	= **Total Allowed** (Watts)	≥	Total Designed (Watts)	Adjustments PAF Lighting Control Credits 140.6(a)2 / 170.2(e)1B (-)	= **Total Adjusted** (Watts) *Includes Adjustments		**05 must be >= 08 140.6 / 170.2(e)**
	(See Table I)	(See Table I)	(See Table J)	(See Table K)			(See Table F)	(See Table P)			
Conditioned		1,057.59			= 1,057.59	≥	148		= 148		COMPLIES
Unconditioned					=	≥			=		
Controls Compliance (See Table H for Details)											COMPLIES
Rated Power Reduction Compliance (See Table Q for Details)											

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
Documentation Software: Energy Code Ace
Compliance ID: 113711-0623-0004
Report Generated: 2023-06-12 22:11:26

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE — NRCC-LTI-E

Project Name: RETAIL BUILDING	**Report Page:** (Page 3 of 7)
	Date Prepared: 2023-06-13T01:11:23-04:00

F. INDOOR LIGHTING FIXTURE SCHEDULE

This table includes all planned permanent and portable lighting other than dwelling unit/ hotel/ motel room lighting. Multifamily dwelling unit and hotel/motel room lighting is documented in Table T. If using Table T to document lighting in multifamily common use areas providing shared provisions for living, eating, cooking or sanitation, those luminaires are not included here.

Designed Wattage: Conditioned Spaces

01	02	03	04	05	06	07	08	09	10	
									Field Inspector	
Name or Item Tag	Complete Luminaire Description	Modular (Track) Fixture	Small Aperture & Color Change[1]	Watts per luminaire[2]	How is Wattage determined	Total Number of Luminaires	Excluded per 140.6(a)3 / 170.2(e)2C	Design Watts	Pass	Fail
A	1X4 SUSPENDED LED LIGHTS	No	NA	44	Mfr. Spec	3	No	132	☐	☐
D	WALL MOUNTED LIGHT FIXTURE	No	NA	16	Mfr. Spec	1	No	16	☐	☐
							Total Designed Watts: CONDITIONED SPACES	148		

[1]*FOOTNOTE: Design Watts for small aperture and color changing luminaires which qualify per 140.6(a)4B / 170.2(e)2D is adjusted to be 75% /80% of their rated wattage. Table F automatically makes this adjustment, the permit applicant should enter full rated wattage in column 05.*

[2]*Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b). Wattage used must be the maximum rated for the luminaire, not the lamp.*

G. MODULAR LIGHTING SYSTEMS

This section does not apply to this project.

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

This table includes lighting controls for conditioned and unconditioned spaces.

Building Level Controls

01	02	03	
		Field Inspector	
Mandatory Demand Response 110.12(c)	Shut-off controls 130.1(c) / 160.5(b)4C	Pass	Fail
NA < 4,000W subject to multilevel	See Area/Space Level Controls	☐	☐

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
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STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION
CERTIFICATE OF COMPLIANCE — NRCC-LTI-E

Project Name: RETAIL BUILDING	**Report Page:** (Page 4 of 7)
	Date Prepared: 2023-06-13T01:11:23-04:00

H. INDOOR LIGHTING CONTROLS (Not including PAFs)

Area Level Controls

04	05	06	07	08	09	10	11	12	
								Field Inspector	
Area Description	Complete Building or Area Category Primary Function Area	Manual Area Controls 130.1(a) / 160.5(b)4A	Multi-Level Controls 130.1(b) / 160.5(b)4B	Shut-Off Controls 130.1(c) // 160.5(b)4C	Primary/Skylit Daylighting 130.1(d) / 160.5(b)4D	Secondary Daylighting 130.1(d) / 160.5(b)4D	Interlocked Systems 140.6(a)1/ 170.2(e)2A	Pass	Fail
TENANT SPACE	All Other Space Types	Readily Accessible	Dimmer	Auto. Time Switch	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
FIRE RISER	Electrical Mechancial Telephone Room	Readily Accessible	NA: Enclosed area w/ 1 luminaire <=2 Lamps	NA: Elec. equip. rm	NA: Not daylit zone	NA: Not daylit zone	No	☐	☐
					13				
					Plan Sheet Showing Daylit Zones:				

I. LIGHTING POWER ALLOWANCE: COMPLETE BUILDING OR AREA CATEGORY METHODS

Each area complying using the Complete Building or Area Category Methods per 140.6(b) are included in this table. Column 06 indicates if additional lighting power allowances per 140.6(c) or adjustments per 140.6(a) are being used .

Conditioned Spaces

01	02	03	04	05	06	
					Additional Allowance / Adjustment	
Area Description	Complete Building or Area Category Primary Function Area	Allowed Density (W/ft²)	Area (ft²)	Allowed Wattage (Watts)	Area Category	PAF
TENANT SPACE	All Other Space Types	0.4	2,630	1,052	No	No
FIRE RISER	Electrical Mechancial Telephone Room	0.4	14	5.6	No	No
		TOTALS:	2,644	1,057.59	See Tables J, or P for detail	

CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance
Generated Date/Time:
Report Version: 2022.0.000
Schema Version: rev 20220101
Documentation Software: Energy Code Ace
Compliance ID: 113711-0623-0004
Report Generated: 2023-06-12 22:11:26

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SHEET TITLE

ELECTRICAL
TITLE 24
INTERIOR
PART 1

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E2.0

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 5 of 7)**
	Date Prepared:	2023-06-13T01:11:23-04:00

J. ADDITIONAL ALLOWANCE: AREA CATEGORY METHOD QUALIFYING LIGHTING SYSTEM
This section does not apply to this project.

K. TAILORED METHOD GENERAL LIGHTING POWER ALLOWANCE
This section does not apply to this project.

L. ADDITIONAL LIGHTING ALLOWANCE: TAILORED WALL DISPLAY
This section does not apply to this project.

M. ADDITIONAL LIGHTING ALLOWANCE: TAILORED FLOOR AND TASK LIGHTING
This section does not apply to this project.

N. ADDITIONAL LIGHTING ALLOWANCE: TAILORED DECORATIVE /SPECIAL EFFECTS
This section does not apply to this project.

O. ADDITIONAL LIGHTING ALLOWANCE: TAILORED VERY VALUABLE MERCHANDISE
This section does not apply to this project.

P. POWER ADJUSTMENT: LIGHTING CONTROL CREDIT (POWER ADJUSTMENT FACTOR (PAF))
This section does not apply to this project.

Q. RATED POWER REDUCTION COMPLIANCE FOR ONE-FOR-ONE ALTERATIONS
This section does not apply to this project.

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 6 of 7)**
	Date Prepared:	2023-06-13T01:11:23-04:00

R. 80% LIGHTING POWER FOR ALL ALTERATIONS - CONTROLS EXCEPTIONS
This section does not apply to this project.

S. DAYLIGHT DESIGN POWER ADJUSTMENT FACTOR (PAF)
This section does not apply to this project.

T. DWELLING UNIT LIGHTING
This section does not apply to this project.

U. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
Selections have been made based on information provided in this document. If any selections have been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTI-E - Must be submitted for all buildings

V. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
Selections have been made based on information provided in this document. If any selections have been changed by the permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and any with "-A" in the form name must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: http://www.energy.ca.gov/title24/attcp/providers.html

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTI-02-A - Must be submitted for occupancy sensors and automatic time switch controls.	TENANT SPACE

STATE OF CALIFORNIA
Indoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTI-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 7 of 7)**
Project Address: 2219 EL CAMINO REAL, REDWOOD CITY, CA 94063	**Date Prepared:**	2023-06-13T01:11:23-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: RAMIL BATIANCILA	Documentation Author Signature: Ramil Batiancila
Company: MR ENGINEERING CONSULTANTS, INC.	Signature Date: 06.09.2023
Address: 39210 STATE ST. STE. 106	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: FREMONT, CA 94538	Phone: 510-449-4862

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: RAMIL BATIANCILA	Responsible Designer Signature: Ramil Batiancila
Company: MR ENGINEERING CONSULTANTS, INC.	Date Signed: 06.09.2023
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SHEET TITLE

ELECTRICAL
TITLE 24
INTERIOR
PART 2

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E2.1

STATE OF CALIFORNIA

Outdoor Lighting

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE **NRCC-LTO-E**

This document is used to demonstrate compliance with requirements in 110.9, 130.0, 130.2, 140.7, and 141.0(b)2L for outdoor lighting scopes using the prescriptive path for nonresidential and hotel/motel occupancies. It is also used to document compliance with requirements in 160.5, 170.2(e)6, 180.1(a) and 180.2(b)4Bv for outdoor lighting scopes using the prescriptive path for multifamily and mixed-use occupancies. Multifamily includes dormitory and senior living facilities.

Project Name: RETAIL BUILDING	**Report Page:** **(Page 1 of 8)**
Project Address: 2219 EL CAMINO REAL, REDWOOD CITY, CA 94063	**Date Prepared:** 2023-06-09T01:12:24-04:00

A. GENERAL INFORMATION

01	Project Location (city)	REDWOOD	04	Total Illuminated Hardscape Area (ft²)	648
02	Climate Zone	3			
03	Outdoor Lighting Zone per Title 24 Part 1	10.114 or as designated by Authority Having Jurisdiction (AHJ):			
☐	LZ-0: Very Low - Undeveloped Parkland	☐ LZ-2: Moderate - Urban Clusters	☐	LZ-4: High - Must be reviewed by CA Energy Commission for Approval	
☐	LZ-1: Low - Rural Areas	☒ LZ-3: Moderately High - Urban Areas			
05	Occupancy Types within Project				
● Retail					

B. PROJECT SCOPE

This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv for alterations.

My Project Consists of:

01	02	
☒ New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6	
☐ Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)? ○ Yes ○ No	
03	04	05
% of Existing Luminaires Being Altered[1]	Sum Total of Luminaires Being Added or Altered	Calculation Method
☐ < 10% ☐ >= 10% and < 50% ☐ >= 50%		

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.

[1] *FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.*

STATE OF CALIFORNIA

Outdoor Lighting

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE **NRCC-LTO-E**

Project Name: RETAIL BUILDING	**Report Page:** **(Page 3 of 8)**
	Date Prepared: 2023-06-09T01:12:24-04:00

F. OUTDOOR LIGHTING FIXTURE SCHEDULE

For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:

01	02		03	04	05	06	07	08	09	10	
Name or Item Tag	Complete Luminaire Description		Watts per luminaire[1, 2]	How is Wattage determined	Total Number Luminaires[2]	Luminaire Status[3]	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)1[4]	Field Inspector	
										Pass	Fail
B	RECESSED EXTERIOR SOFFIT LIGHT	☐ Linear	49	Mfr. Spec	2	New	☐	98	NA: < 6200 lumens	☐	☐
C	EXTERIOR WALL SCONCE	☐ Linear	55	Mfr. Spec	2	New	☐	110	NA: < 6200 lumens	☐	☐
							Total Design Watts:	208			

* NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)

[1] *FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)*

[2] *For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.*

[3] *Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.*

[4] *Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b)/ 160.5(c)*

G. SHIELDING REQUIREMENTS (BUG)

This section does not apply to this project.

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STATE OF CALIFORNIA

Outdoor Lighting

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE **NRCC-LTO-E**

Project Name: RETAIL BUILDING	**Report Page:** **(Page 2 of 8)**
	Date Prepared: 2023-06-09T01:12:24-04:00

C. COMPLIANCE RESULTS

Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv													Compliance Results		
01		02		03		04		05		06		07		08	09
General Hardscape Allowance 140.7(d)1 / 170.2(e)6 (See Table I)	+	Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+	Sales Frontage 140.7(d)2 (See Table K)	+	Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+	Per Specific Area 140.7(d)2 / 170.2(e)6 (See Table M)	OR	Existing Power Allowance 141.0(b)2L / 180.2(b)4Bv (See Table N)	=	**Total Allowed** (Watts)	≥	**Total Actual** (Watts)	**07 must be >= 08**
278.39	+	38	+	---	+	---	+	---	OR	---	=	316.39	≥	208	COMPLIES
Shielding Compliance (See Table G for Details)															N/A
Controls Compliance (See Table H for Details)															COMPLIES

D. EXCEPTIONAL CONDITIONS

This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS

This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.

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STATE OF CALIFORNIA

Outdoor Lighting

CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE **NRCC-LTO-E**

Project Name: RETAIL BUILDING	**Report Page:** **(Page 4 of 8)**
	Date Prepared: 2023-06-09T01:12:24-04:00

H. OUTDOOR LIGHTING CONTROLS

This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings

01	02	03	04	05	
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector	
				Pass	Fail
BUILDING EXTERIOR: "C"	Astronomical Timer	Provided	Provided	☐	☐
ENTRANCE/EXIT: "B"	Astronomical Timer	Provided	Provided	☐	☐

[1] *FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.*

[2] *Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.*

[3] *Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are excepted from ii and iii.*

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SHEET TITLE

ELECTRICAL
TITLE 24
EXTERIOR
PART 1

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441

DRAWN: RMB CHECKED: RG

SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E2.2

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 5 of 8)**
	Date Prepared:	2023-06-09T01:12:24-04:00

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))

This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-R while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance.
Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H. and are not included here. All other multifamily outdoor lighting is included here.

01				
	"Use it or lose it" Allowance (select all that apply) (select all that apply)			
☒ General Hardscape Allowance Table I (below)	☒ Per Application Table J	☐ Sales Frontage Table K	☐ Ornamental Table L	☐ Per Specific Area Table M

Calculated General Hardscape Lighting Power Allowance per Table 140.7-A for Nonresidential & Hotel/Motel

02	03	04	05	06	07	08	09
Area Description	Area Wattage Allowance (AWA)			Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
	Illuminated Area (ft^2)	Allowed Density (W/ft^2)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)	
BUILDING EXTERIOR	324	0.021	6.8	108	0.2	21.6	28.4
Initial Wattage Allowance for Entire Site (Watts):							250
Instances of Initial Wattage Allowance (LZ 0 only)[1]							
Total General Hardscape Allowance (Watts):							278.39

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 7 of 8)**
	Date Prepared:	2023-06-09T01:12:24-04:00

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION

Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online

Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE

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Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	BUILDING EXTERIOR: "C"; ENTRACE/EXIT: "B"

STATE OF CALIFORNIA
Outdoor Lighting
CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 6 of 8)**
	Date Prepared:	2023-06-09T01:12:24-04:00

J. LIGHTING ALLOWANCE: PER APPLICATION

This table includes areas using the wattage allowance per application from Table 140.7-B / Table 170.2-S.

01	02	03	04	05	06	07	08	09	10
		CALCULATED ALLOWANCE (Watts)			DESIGN WATTS				
Area Description	Application per Table 140.7-B[1]	# of Locations	Allowance per Location[2]	Extra Allowance (Watts)	Luminaire Name or Item Tag	Watts per Luminaire	# of Luminaires	Design Watts	Additional Allowance (Watts)
ENTRACE/EXIT	Building Entrance/Exit	2	19	38	B	49	2	98	38
							Total Design Watts for this Area:	98	
							Total Allowance (Watts) All Areas:		38

[1] FOOTNOTES: Primary entrance applications are only available for senior care facilities, healthcare facilities, police stations, hospitals, fire stations, and emergency vehicle facilities.
[2] The Allowance per Location for ATMs is 100W for the first ATM and 35W for each additional per Table 140.7-B /Table 170.2-S.
[3] For luminaires indicated in Table F as linear, wattage in column 07 is W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 08 instead of number of luminaires.

K. LIGHTING ALLOWANCE: SALES FRONTAGE

This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL

This section does not apply to this project.

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA

This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)

This section does not apply to this project.

STATE OF CALIFORNIA
Outdoor Lighting
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CERTIFICATE OF COMPLIANCE		NRCC-LTO-E
Project Name: RETAIL BUILDING	**Report Page:**	**(Page 8 of 8)**
Project Address: 2219 EL CAMINO REAL, REDWOOD CITY, CA 94063	**Date Prepared:**	2023-06-09T01:12:24-04:00

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: RAMIL BATIANCILA	Documentation Author Signature:
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Address: 39210 STATE ST. STE. 106	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: FREMONT, CA 94538	Phone: 510-449-4862

RESPONSIBLE PERSON'S DECLARATION STATEMENT

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1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer)
3. The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

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Exp. 08/30/24
ELECTRICAL
STATE OF CALIFORNIA

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SHEET TITLE

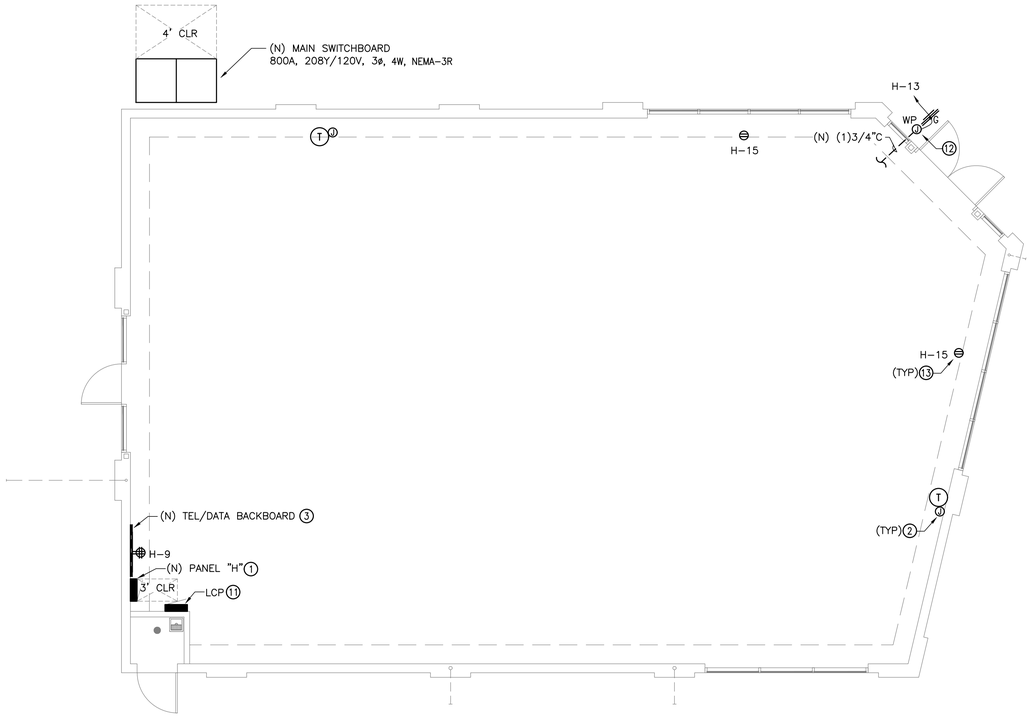
ELECTRICAL
TITLE 24
EXTERIOR
PART 2

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
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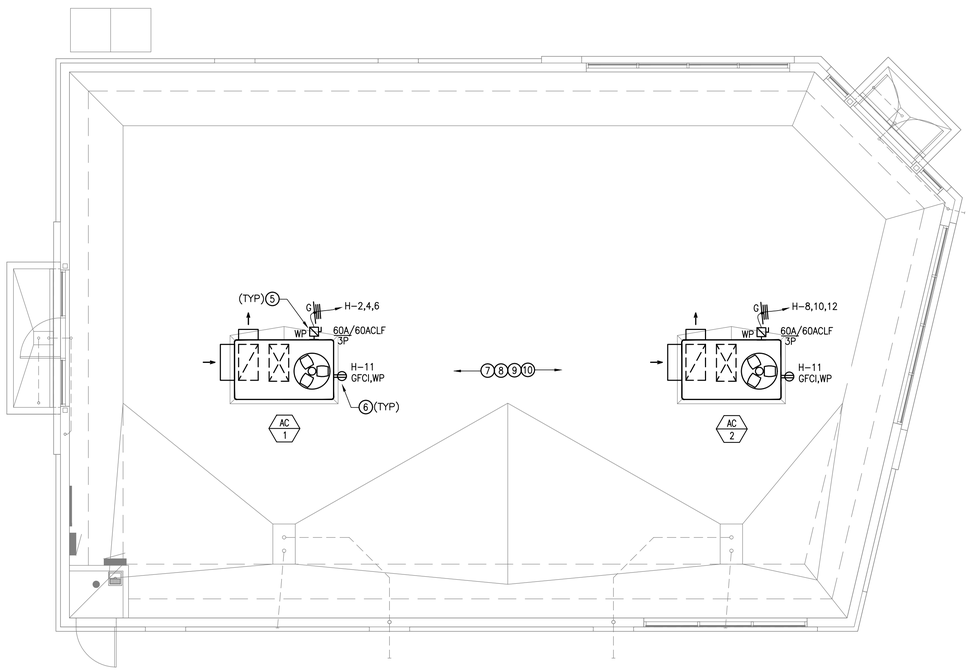
SHEET

E2.3



1 ELECTRICAL POWER PLAN

E3.0 SCALE: 3/16"=1'-0"



2 ELECTRICAL ROOF PLAN

E3.0 SCALE: 3/16"=1'-0"

SHEET NOTES:

1. COORDINATE WITH ARCHITECT/OWNER THE FINAL LOCATION OF PANELBOARDS UPON INSTALLATION. PROVIDE 3 FT. ACCESS AND WORKING CLEARANCE IN FRONT OF THE EQUIPMENT.
2. PROVIDE JUNCTION BOX FOR THERMOSTAT. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION.
3. PROVIDE FIRE TREATED BACKBOARD THE ENTIRE LENGTH OF WALL UP TO CEILING HEIGHT. COORDINATE REQUIREMENT WITH OWNER'S I.T. REPRESENTATIVE AND PROVIDE AS DIRECTED. COORDINATE WITH ARCHITECT/OWNER THE FINAL LOCATION UPON INSTALLATION.
4. ELECTRICAL CONTRACTOR TO VERIFY AND COORDINATE WITH ARCHITECT/EQUIPMENT VENDOR THE EXACT LOCATION OF EQUIPMENT INCLUDING FINAL ELECTRICAL REQUIREMENTS PRIOR TO INSTALLATION.
5. PROVIDE NEW DISCONNECT SWITCH FOR AC UNIT. COORDINATE LOCATION OF DISCONNECT SWITCH WITH MECHANICAL VENDOR PRIOR TO INSTALLATION. PROVIDE FLEXIBLE LIQUIDTIGHT METAL CONDUIT BETWEEN DISCONNECT SWITCH AND TERMINATION POINT AT MECHANICAL UNIT.
6. PROVIDE WEATHERPROOF AND GFCI PROTECTED RECEPTACLES WITHIN 25 FT. OF HVAC EQUIPMENT PER 2022 CEC ART. 210.63 & 406.9(B)(1).
7. REFER TO EQUIPMENT SCHEDULE FOR THE SIZES OF WIRES/CABLES & CONDUITS AS WELL AS THE RATINGS OF FUSED DISCONNECTS.
8. ALL CONDUITS PENETRATION ON ROOF MUST BE COORDINATED WITH ARCHITECT. PROVIDE FLASHING AND COUNTER FLASHING AND WATER TIGHT ALL CONDUITS PENETRATION ON ROOF. RUN ALL CONDUITS IN GROUP AND IN A WELL ORGANIZED MANNER.
9. PROVIDE RIGID STEEL CONDUIT INCLUDING FITTINGS ON ALL CONDUITS ON ROOF AND EXTERIOR INSTALLATION.
10. RUN FEEDER AND BRANCH CIRCUIT WIRING ON ROOF ALONG MECHANICAL PATH. PROVIDE ROOF SLEEPERS FOR PROPER CONDUIT SUPPORT AND INSTALLATION.
11. LIGHTING CONTROL PANEL. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.
12. PROVIDE WEATHERPROOF JUNCTION BOX AND 3/4"C WITH PULL WIRE FOR SIGNAGE. ELECTRICAL CONTRACTOR TO COORDINATE ALL WORK WITH ARCHITECT AND OWNER INCLUDING LOCATION.
13. PROVIDE CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW. VERIFY EXACT LOCATION OF PANELS WITH ARCHITECT OR OWNER.

GENERAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL VERIFY (E) FIELD CONDITIONS PRIOR TO BID. ANY DISCREPANCIES BETWEEN DRAWINGS & (E) CONDITIONS FOUND DURING INSTALLATION SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION & SHOULD BE RESOLVED AT NO ADDITIONAL COST TO THE OWNER.
2. ALL WIRING TO BE COPPER "THWN". SEE PANEL SCHEDULE FOR SIZING.
3. ELECTRICAL CONTRACTOR TO SUPPLY OWNER WITH DRAWINGS OF THE AS-BUILT CONDITION OF THE WIRING SYSTEM UPON COMPLETION.
4. ALL CONSTRUCTION OF THIS PROJECT SHALL CONFORM TO ALL LOCAL CODES, ORDINANCES AND CURRENT ELECTRIC & BUILDING CODES.
5. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH ALL LOCAL COUNTY, STATE AND FEDERAL CODES, ORDINANCES, RULES AND REGULATIONS INCLUDING ALL REQUIREMENTS OF GOVERNING AGENCIES. ELECTRICAL CONTRACTOR SHALL PAY ALL COSTS, ASSOCIATED WITH THE INSTALLATION, INCLUDING BUILDING APPLICATION FEES, ETC.
6. ALL RECEPTACLES OUTLETS ON BRANCH CIRCUITS OF 30-AMPERES OR LESS AND COMMUNICATION SYSTEM RECEPTACLES SHALL BE LOCATED NO MORE THAN 48 INCHES MEASURED FROM THE TOP OF THE RECEPTACLE OUTLET BOX OR RECEPTACLE HOUSING NO LESS 15 INCHES MEASURED TO THE BOTTOM OF THE RECEPTACLE OUTLET BOX OR RECEPTACLE HOUSING ABOVE FINISHED FLOOR.
7. ALL ELECTRICAL ROUGH-INS SHOWN ON THIS PLAN PERTAINS ONLY TO THE EQUIPMENT BEING FURNISHED BY VENDOR. ANY ADDITIONAL REQUIREMENTS SHALL BE SPECIFIED BY THE OWNER AND/OR THE GENERAL CONTRACTOR.
8. ALL DISCONNECTING MEANS SHALL BE IDENTIFIED FOR ITS PURPOSE AS PER 2022 CEC ARTICLE 110.22.
9. ELECTRICAL CONTRACTOR TO VERIFY INCOMING SERVICE, TO PROVIDE FINAL CONNECTIONS TO ALL APPLICABLE SERVICE EQUIPMENT AND TO PROVIDE ALL SWITCHES, BREAKERS, CONDUIT, STARTERS, ETC., UNLESS OTHERWISE STATED.
10. ELECTRICAL CONTRACTOR TO PROVIDE ALL JUNCTION BOXES, OUTLETS, AND RECEPTACLE IN FIXTURES, FABRICATOR TO LOCATE ALL RECEPTACLES AND SWITCHES WHEN PART OF FIXTURES INTERNAL WIRING.
11. ELECTRICAL CONTRACTOR TO PROVIDE APPROPRIATE LENGTH PIGTAIL FLEX CONDUIT AT ALL DIRECT CONNECT STUB OUTS, AND CONNECT TO FIXTURES.
12. ELECTRICAL CONTRACTOR TO PROVIDE A MINIMUM OF THREE WIRES PLUS GROUND ON ALL 208 VOLT CIRCUITS.
13. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL STAINLESS STEEL COVER PLATES FOR ALL RECEPTACLES AND SWITCHES FOR FOOD PREP. AREAS UNLESS NOTED OTHERWISE. RECEPTACLES TO BE SET HORIZONTALLY WHERE NOTED OR REQUIRED DUE SPACE CONSTRAINED. (E.G. BAR DIEWALLS).
14. ELECTRICAL CONTRACTOR TO COMPLETE ALL NECESSARY FORMS TO SATISFY TITLE 24 BUILDING DEPARTMENT REQUIREMENTS.
15. ELECTRICAL CONTRACTOR TO PROVIDE CONVENIENCE OUTLETS WHERE APPLICABLE PER CODES AND OWNER'S REQUIREMENTS.
16. ELECTRICAL CONTRACTOR TO CONTACT CLIENT REGARDING ELECTRICAL INFORMATION AND LOCATION FOR SOUND SYSTEMS; CASH REGISTERS; TELEPHONE SYSTEMS; OR ANY OTHER FIXTURES NOT RELATED TO SERVICE EQUIPMENT PROVIDED.
17. ALL EXISTING EQUIPMENT AND/OR OWNER SUPPLIED ITEMS SHALL BE VERIFIED BY THE ELECTRICAL CONTRACTOR FOR UTILITY REQUIREMENTS PRIOR TO ROUGH-IN.
18. ELECTRICAL ROUGH-INS ARE SUBJECT TO CHANGE PENDING THE FINAL SELECTION OF EQUIPMENT AND LOCATION OF SAME.
19. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH AND EVERY PHASE (LINE) CONDUCTOR; TO COMPLY WITH CEC ARTICLE 210.4 FOR MULTI-WIRE CIRCUITS AND TO PERMIT INDIVIDUAL OPERATION/CONTROL OF EACH BRANCH CIRCUIT OR PROVIDE TIE HANDLE ON BREAKERS TO SUIT SINGLE NEUTRAL ON MULTI-CIRCUITS HOMERUNS- NEUTRAL MUST BE MINIMUM #10 ON MULTI CIRCUITS.
20. THE CONTRACTOR/INSTALLER SHALL IMMEDIATELY NOTIFY IN WRITING THE PROJECT OWNER AND M+R (CONSULTANT) FOR CLARIFICATION OF ANY DISCREPANCY IN THIS DESIGN PACKAGE OR ANY CONFLICT WITH OTHER TRADES PRIOR TO COMMENCING THE WORK. ALL WORKS, SERVICES, INSTALLATION OR SUPPLY OF EQUIPMENT AND DEVICES RESULTING FROM ALTERATION OR DEVIATION FROM THIS DESIGN AND ITS INTENT WITHOUT THE WRITTEN NOTIFICATION TO AND APPROVAL FROM M+R SHALL BE ON THE ACCOUNT OF THE CONTRACTOR/INSTALLER.
21. FOR ELECTRICAL PENETRATIONS OF FIRE-RATED WALLS, PROVIDE PROTECTION PER CBC CHAPTER 7. PENETRATIONS ON OPPOSITE SIDES OF THE WALL SHALL BE SEPARATED BY ONE OF THE FOLLOWING:
    A. CAVITY FILLED WITH CELLULOSE LOOSE-FILL, ROCKWOOL OR SLAG MINERAL WOOL INSULATION
    B. HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES
    C. SOLID FIREBLOCKING
    D. PROTECTING BOTH OUTLET BOXES WITH LISTED MATERIALS AND METHODS
22. PER CEC ARTICLE 518.4, THE FIXED WIRING METHODS SHALL BE METAL RACEWAYS, FLEXIBLE METAL RACEWAYS, NONMETALLIC RACEWAYS ENCASED IN NOT LESS THAN 2 IN. OF CONCRETE, TYPE MI, MC, OR AC CABLE. THE WIRING METHOD SHALL ITSELF QUALIFY AS AN EQUIPMENT GROUNDING CONDUCTOR ACCORDING TO 250.118 OR SHALL CONTAIN AN INSULATED EQUIPMENT GROUNDING CONDUCTOR SIZE IN ACCORDANCE WITH TABLE 250.122.
23. ALL 15 AND 20-AMPERE, 125 AND 250-VOLT NONLOCKING-TYPE RECEPTACLES IN THE AREAS SPECIFIED IN 406.12(1) THROUGH (7) SHALL BE LISTED TAMPER-RESISTANT RECEPTACLES.

EQUIPMENT SCHEDULE 4

CODE	QTY.	DESCRIPTION	MANUFACTURER	MODEL NO.	VOLTAGE	PHASE	AMPS	VA	TYPE OF CONNECTION	FEEDER
AC-1	1	AC UNIT	TRANE	WHC102H3	208	3	46.0	16572	DISCONNECT SWITCH	1"C(3)#4 AWG & (1)#10GND
AC-2	1	AC UNIT	TRANE	WHC102H3	208	3	46.0	16572	DISCONNECT SWITCH	1"C(3)#4 AWG & (1)#10GND

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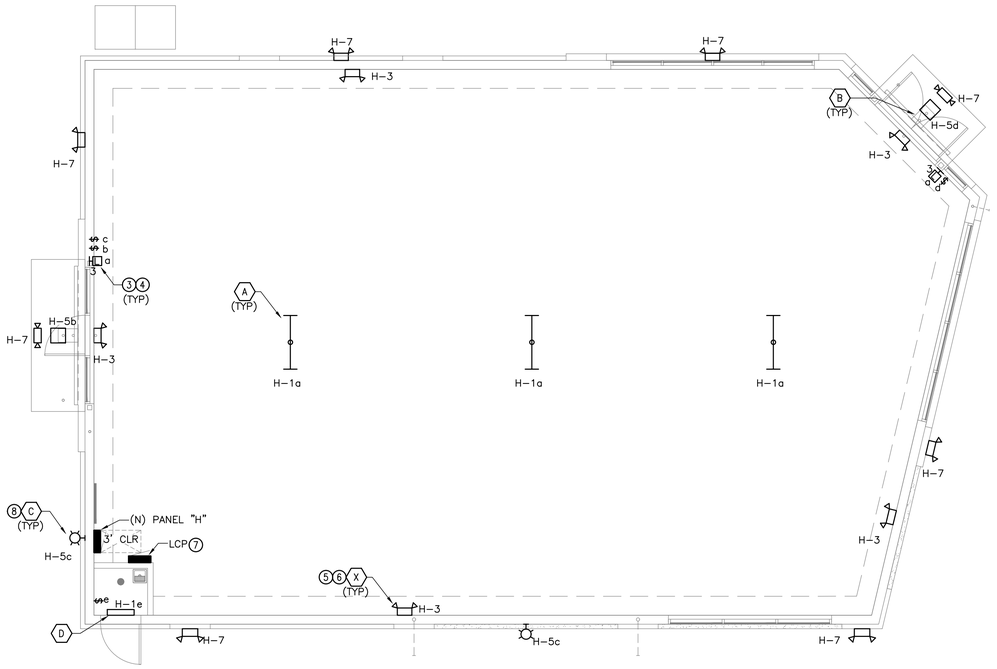
ELECTRICAL POWER & ROOF PLAN

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
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SHEET

E3.0



1 E4.0 ELECTRICAL LIGHTING PLAN

SCALE: 3/16"=1'-0"

LIGHTING FIXTURE SCHEDULE ①②

	FIXTURE TYPE	DESCRIPTION	MANUFACTURER'S CATALOG NO.	LAMPS	VOLT	WATTS	MOUNTING
	A	1X4 SUSPENDED LED LIGHTING DIMMABLE	LSI SW-4-60L-840-UNV-EM OR APPROVED EQUAL	LED	120	44	CEILING MOUNTED
	B	RECESSED EXTERIOR SOFFIT LIGHT SUITABLE FOR WET LOCATION	LSI XSPS-S-LED-VHO-NW-120 OR APPROVED EQUAL	LED	120	49	RECESSED MOUNTED
	C	EXTERIOR WALL SCONCE	LSI XPWS3-WT-LED-48-350-UE-PCI120 OR APPROVED EQUAL	LED	120	55	WALL MOUNTED
	D	WALL MOUNTED LIGHT FIXTURE	LSI SW-2-20L-830-UNV OR APPROVED EQUAL	LED	120	16	WALL MOUNTED
	X	EMERGENCY LIGHT FIXTURE WITH 90 MINS. BATTERY BACK UP	LITHONIA LIGHTING HGX SERIES OR APPROVED EQUAL	LED	120	6	WALL/CEILING MOUNTED

SHEET NOTES:

① ALL DRIVER AND BALLAST SHALL COMPLY WITH T24, MINIMUM REQUIRED CONTROL STEPS AND UNIFORM ILLUMINANCE LEVEL.

② ELECTRICAL CONTRACTOR TO SEEK FOR ARCHITECT AND OWNER'S APPROVAL PRIOR TO PROCUREMENT OF ANY FIXTURE.

③ VERIFY EXACT LOCATION OF LIGHTING SWITCH WITH ARCHITECT OR OWNER.

④ PROVIDE DIMMING CONTROL SWITCH TO SUIT LIGHT FIXTURE'S DIMMING REQUIREMENT. PROVIDE COMPATIBLE DIMMING CONTROL SWITCH & ASSOCIATED COMPONENTS TO SUIT LIGHTING CONTROLS.

⑤ PROVIDE HOT UNSWITCHED FOR EMERGENCY/EXIT LIGHT. PROVIDE WITH 90 MINUTE EMERGENCY BATTERY PACK. VERIFY EXACT LOCATION WITH ARCHITECT/OWNER.

⑥ VERIFY WITH OWNER EXACT LOCATION AND MOUNTING HEIGHT OF EMERGENCY EGRESS LIGHTING ABOVE DOOR AND PLATE GLASS.

⑦ LIGHTING CONTROL PANEL. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.

⑧ ALL NEWLY INSTALLED OUTDOOR LIGHTING SHALL BE CONTROLLED BY PHOTOCONTROL OR OUTDOOR ASTRONOMICAL TIME-SWITCH CONTROL, OR OTHER CONTROL CAPABLE OF AUTOMATICALLY SHUTTING OFF THE OUTDOOR LIGHTING WHEN DAYLIGHT IS AVAILABLE AS PER TITLE 24 130.2(C). COORDINATE WITH ARCHITECT THE EXACT LOCATION.

GENERAL NOTES:

1. ALL WIRING TO BE COPPER "THWN," UNLESS OTHERWISE NOTED. SEE PANEL SCHEDULE FOR SIZING.
2. ELECTRICAL CONTRACTOR TO SUPPLY OWNER WITH DRAWINGS OF THE AS-BUILT CONDITION OF THE WIRING SYSTEM UPON COMPLETION.
3. ALL CONSTRUCTION OF THIS PROJECT SHALL CONFORM TO ALL LOCAL CODES, ORDINANCES AND CURRENT ELECTRIC & BUILDING CODES.
4. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH ALL LOCAL COUNTY, STATE AND FEDERAL CODES, ORDINANCES, RULES AND REGULATIONS INCLUDING ALL REQUIREMENTS OF GOVERNING AGENCIES. ELECTRICAL CONTRACTOR SHALL PAY ALL COSTS, ASSOCIATED WITH THE INSTALLATION, INCLUDING BUILDING APPLICATION FEES, ETC.
5. ELECTRICAL CONTRACTOR SHALL VERIFY (E) FIELD CONDITIONS PRIOR TO BID. ANY DISCREPANCIES BETWEEN DRAWINGS & (E) CONDITIONS FOUND DURING INSTALLATION SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION & SHOULD BE RESOLVED AT NO ADDITIONAL COST TO THE OWNER.
6. ALL LIGHTING CIRCUITS SHALL BE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. IF ANY DISCREPANCIES WITH SWITCHING LAYOUT, VERIFY WITH ARCHITECT. LIGHTING SHALL MEET TITLE 24 REQUIREMENTS.
7. VERIFY THE TYPE OF CEILING SYSTEM WITH GENERAL CONTRACTOR OR CEILING CONTRACTOR. PROVIDE FIXTURES WHICH ARE COMPATIBLE WITH THE CEILING SYSTEM AND INCLUDE ALL REQUIRED MOUNTING ACCESSORIES AND HARDWARE.
8. SUPPORT CEILING MOUNTED LIGHTING FIXTURES DIRECTLY FROM THE BUILDING STRUCTURE. DO NOT SUPPORT FIXTURES FROM PIPING, DUCTWORK OR ANY OTHER EQUIPMENT, OR SOLELY FROM THE SUSPENDED CEILING.
9. ALL LIGHTING FIXTURES SHALL BE NRTL LISTED.
10. ALL SWITCH LOCATIONS SHALL BE VERIFIED WITH THE ARCHITECT PRIOR TO ROUGH-IN.
11. CONTRACTOR SHALL PROVIDE ADDITIONAL EXIT SIGN(S) IF REQUIRED BY THE CITY FIRE MARSHALL INSPECTOR AT NO ADDITIONAL COST TO THE OWNER.
12. ALL EXIT SIGNS SHALL BE READILY VISIBLE FROM ANY DIRECTION OF EGRESS TRAVEL.
13. ANY FIXTURE SUBSTITUTION MUST BE APPROVED BY THE ARCHITECT OR OWNER PRIOR TO BID.
14. DRAWING SHOWS CIRCUITING AND SWITCHING REQUIREMENTS AND FIXTURE TYPES ONLY. VERIFY EXACT LIGHTING FIXTURES AND STANDARD SWITCHING WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION. ALSO VERIFY EXACT LIGHTING FIXTURES FINISH PRIOR TO INSTALLATION.
15. PROVIDE 90 MINUTE MINIMUM EMERGENCY BATTERY PACK FOR EXIT SIGNS. (SHALL COME TO FULL BRIGHT).
16. ALL QUANTITIES SHALL BE FIELD VERIFIED PRIOR TO BID. NOTIFY ENGINEER FOR ANY DISCREPANCIES IN DRAWINGS.
17. FOR ELECTRICAL PENETRATIONS OF FIRE-RATED FLOOR/CEILING, PROVIDE PROTECTION PER CBC CHAPTER 7. RECESSED FIXTURES SHALL BE LISTED AND SHALL BE EITHER ONE OF THE FOLLOWING:
    1. FIXTURES HAVE BEEN TESTED FOR USE IN FIRE-RESISTANCE-RATED ASSEMBLIES OR
    2. FIXTURES SHALL BE PROTECTED WITH A LISTED FIRE-RATED LIGHT COVER.
18. INSTALL GROUNDED (NEUTRAL) CONDUCTORS OR PROVIDE RACEWAY TO ALL SWITCH LOCATIONS AS PER THE 2022 C.E.C. ART. 404.2.
19. ALL CONTROLS AND SWITCHES INTENDED TO BE USED BY OCCUPANT OF THE ROOM OR AREA TO CONTROL LIGHTING SHALL LOCATED NO MORE THAN 48 INCHES MEASURED FROM THE TOP OF THE JUNCTION OR DEVICE BOX NOR LESS THAN 15 INCHES MEASURED TO THE BOTTOM OF THE JUNCTION OR DEVICE BOX ABOVE THE FINISHED FLOOR.
20. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 1 FOOT-CANDLE (11 LUX) AT THE WALKING SURFACE LEVEL.
21. ELECTRICAL PLANS ARE INTENDED TO SHOW, IN A GENERAL WAY, THE APPROXIMATE LOCATION AND LOADS OF THE INTENDED FIXTURE AND EQUIPMENT. EXACT LOCATIONS AND MATERIALS SHALL BE DETERMINED IN THE FIELD BY THE INSTALLING CONTRACTOR AND SHALL CONFORM TO THE PROVISIONS AS SET FORTH IN THE LATEST EDITION OF THE CALIFORNIA ELECTRICAL CODE, THE CALIFORNIA ENERGY CODE AND THE CALIFORNIA GREEN BUILDING CODE.
22. PROVIDE A SEPARATE NEUTRAL CONDUCTOR FOR EACH AND EVERY PHASE (LINE) CONDUCTOR; TO COMPLY WITH 2022 CEC ARTICLE 210.4 FOR MULTI-WIRE CIRCUITS AND TO PERMIT INDIVIDUAL OPERATION/CONTROL OF EACH BRANCH CIRCUIT OR PROVIDE TIE HANDLE ON BREAKERS TO SUIT SINGLE NEUTRAL ON MULTI-CIRCUITS HOMERUNS- NEUTRAL MUST BE MINIMUM #10 ON MULTI CIRCUITS.
23. PER 2022 CEC ARTICLE 518.4, THE FIXED WIRING METHODS SHALL BE METAL RACEWAYS, FLEXIBLE METAL RACEWAYS, NONMETALLIC RACEWAYS ENCASED IN NOT LESS THAN 2 INCHES OF CONCRETE, TYPE MI, MC, OR AC CABLE. THE WIRING METHOD SHALL ITSELF QUALIFY AS AN EQUIPMENT GROUNDING CONDUCTOR ACCORDING TO 250.118 OR SHALL CONTAIN AN INSULATED EQUIPMENT GROUNDING CONDUCTOR SIZE IN ACCORDANCE WITH TABLE 250.122.
24. PROPOSED LIGHTING FIXTURES AND LAYOUT ARE FOR REFERENCE ONLY. ELECTRICAL CONTRACTOR TO SEEK FOR ARCHITECT AND OWNER'S APPROVAL PRIOR TO PROCUREMENT OF ANY FIXTURE.

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SHEET TITLE

ELECTRICAL LIGHTING PLAN

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

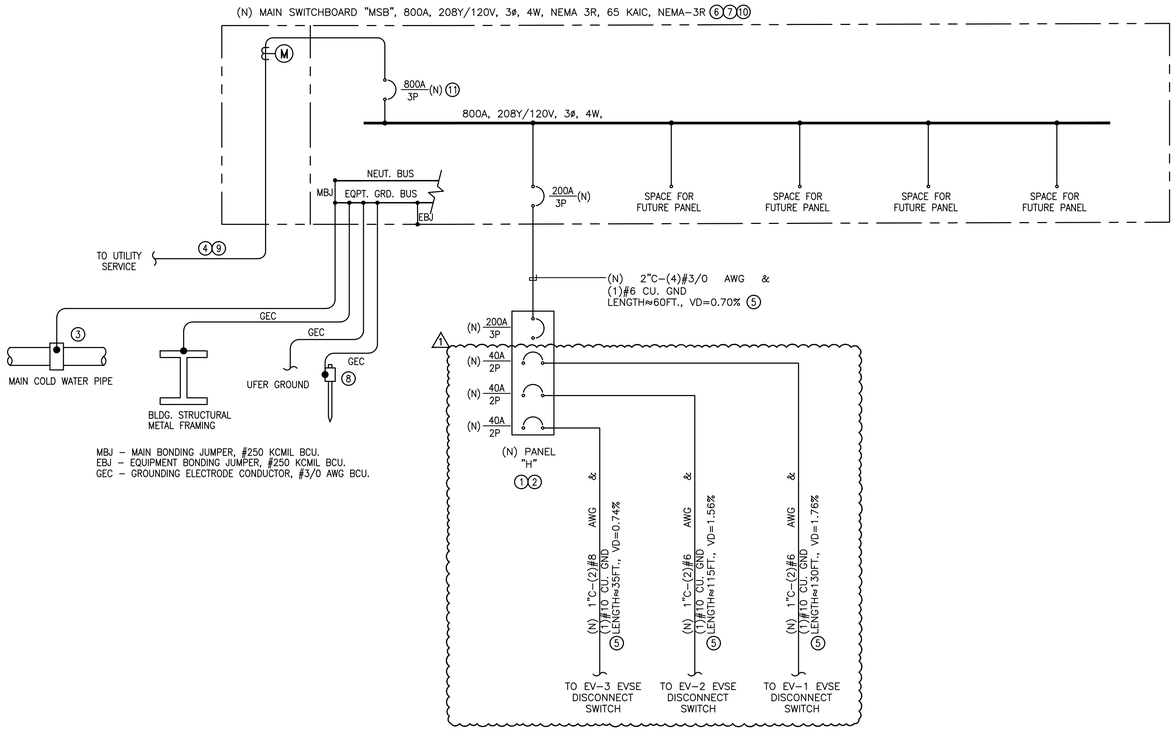
PROJECT #: A2306-AD441

DRAWN: RMB CHECKED: RG

SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E4.0



1 E5.0 SINGLE LINE DIAGRAM

NOT TO SCALE

SHEET NOTES:

1. PROVIDE TYPE WRITTEN PANEL DIRECTORY AT COMPLETION OF PROJECT.
2. PROVIDE NEW LAMINATED PANELBOARD'S NAMEPLATE.
3. GROUNDING ELECTRODE CONNECTION SHALL BE WITHIN FIVE FEET OF THE METALLIC WATER SERVICE INCOMING LINE.
4. ELECTRICAL CONTRACTOR TO COORDINATE WITH PG&E THE ACTUAL SCOPE OF WORKS.
5. FEEDER LENGTH IN VOLTAGE DROP CALCULATION IS FOR APPROXIMATED ONLY. ELECTRICAL CONTRACTOR TO VERIFY EXACT LENGTH AT SITE.
6. KAIC RATING SHOWN IS APPROXIMATED ONLY. ELECTRICAL CONTRACTOR TO COORDINATE WITH PG&E AND OBTAIN THE AVAILABLE FAULT CURRENT (AFC) AND PROVIDE EQUIPMENT/PANELS WITH EQUAL OR HIGHER KAIC RATING.
7. PROVIDE AN ARC-FLASH HAZARD WARNING LABEL/SIGN IN ACCORDANCE TO CEC 2022 ART 110.16.
8. PROVIDE GROUNDING AND BONDING METHODS IN ACCORDANCE TO CEC 2022 250.70.
9. PROVIDE 2-5" CONDUITS FOR SECONDARY FEEDER. PROVIDE SECONDARY PER PG&E GREENBOOK. CONDUIT RADIUS PER PG&E REQUIREMENTS.
10. GROUND RESISTANCE SHALL BE 25 OHMS OR LESS MEASURED BY THREE-POINT METHOD.
11. PROVIDE 100% RATED CIRCUIT BREAKER.

GENERAL NOTES:

1. GROUND RESISTANCE SHALL BE 25 OHMS OR LESS MEASURED BY THREE-POINT METHOD.
2. PROPERLY PHASE COLOR ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS.
3. ALL ELECTRICAL INSTALLATION SHALL BE DONE IN ACCORDANCE WITH REQUIREMENTS OF CEC AND ELECTRIC UTILITY SERVING THE AREA.

LOAD CALCULATION

DESCRIPTION	LOAD DENSITY	QTY	TOTAL CONNECTED LOAD (VA)	DEMAND FACTOR	TOTAL DEMAND LOAD (VA)
RETAIL SPACE	2,630 SF				
GENERAL LIGHTING	2 VA/SF		5,260	125%	6,575
SIGN LIGHTING	1200 VA	2	2,400	125%	3,000
SHOW WINDOW LIGHTING	200 VA/FT	53 FT	10,600	125%	13,250
RECEPTACLE	4		10,520	100%	10,520
HVAC LOAD	17		44,710	125%	55,888
WATER HEATER		1	12,000	100%	12,000
EV CHARGER		3	6,240	125%	23,400
KITCHEN LOADS	17		44,710	100%	44,710
MISCELLANEOUS	30		78,900	125%	98,625
TOTAL LOAD (VA):					267,968
AMPS @208Y/120 VOLTS, 3PH, 4W					744 A
CIRCUIT BREAKER (A):					800A

2 E5.0 LOAD CALCULATION

NOT TO SCALE

1

VOLTS: 120/208V — MAIN: 200A, 3P

PHASE: 3 — (N) PANEL: H — BUSSING: 225A

WIRE: 4 — LOCATION: TENANT SPACE — TYPE: BOLT-ON

AIC: 22 KAIC 6 — ISOLATED GROUND BUS: N/A — MOUNTING: SURFACE

CKT	BKR	LOAD DESCRIPTION	LOAD (VA)	VA A	VA B	VA C	LOAD (VA)	LOAD DESCRIPTION	BKR	CKT
1	20-1P	LIGHTING - RETAIL SPACE	200	2602			2402			2
3	20-1P	EMERGENCY LIGHTING - RETAIL SPAC	100		2502		2402	AC-1	30-3P	4
5	20-1P	LIGHTING - OUTDOOR	210			2612	2402			6
7	20-1P	EMERGENCY LIGHTING - OUTDOOR	100	5384			5284			8
9	20-1P	TEL/DATA BACKBOARD	500		5784		5284	AC-2	50-3P	10
11	20-1P	RECEPTACLE - ROOF	360			5644	5284			12
13	20-1P	SIGNAGE	1200	4320			3120	EV-1 EVSE	40-2P	14
15	20-1P	RECEPTACLE-SHOW WINDOW	1000		4120		3120			16
17		SPACE				3120	3120	EV-2 EVSE	40-2P	18
19		SPACE		3120			3120			20
21		SPACE			3120		3120	EV-3 EVSE	40-2P	22
23		SPACE				3120	3120			24
25		SPACE		0				SPACE		26
27		SPACE			0			SPACE		28
29		SPACE				0		SPACE		30
31		SPACE		0				SPACE		32
33		SPACE			0			SPACE		34
35		SPACE				0		SPACE		36
37		SPACE		0				SPACE		38
39		SPACE			0			SPACE		40
41		SPACE				0		SPACE		42
		CONNECTED kVA PER PHASE		15.43	15.53	14.50				

DEMAND FACTOR APPLICATIONS	conn. load (kVA)	demand factor (%)	demand load (kVA)
RECEPTACLE (FIRST 10kVA)	0.4	100%	0.4
RECEPTACLE (OVER 10kVA)	0.0	50%	0.0
CONTINUOUS LOADS	10.0	125%	12.5
NON-CONTINUOUS LOADS	35.1	100%	35.1

TOTAL CONNECTED LOAD:	45.4 kVA
25% LARGEST MOTOR LOAD:	2.6 kVA
TOTAL DEMAND LOAD:	50.6 kVA
TOTAL SERVICE:	140.4 Amps

3 E5.0 PANEL SCHEDULE

NOT TO SCALE

M I Architects

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SHEET TITLE

ELECTRICAL SINGLE-LINE DIAGRAM, LOAD CALCULATION & PANEL SCHEDULE

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

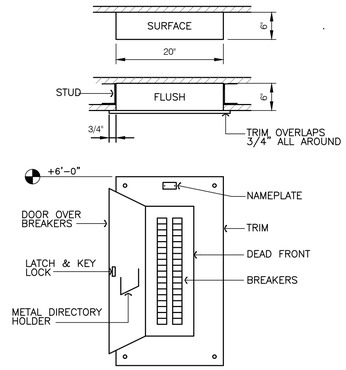
PROJECT #: A2306-AD441

DRAWN: RMB — CHECKED: RG

SCALE: AS SHOWN — DATE: 11.30.2023

SHEET

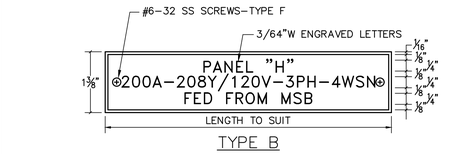
E5.0



VERIFY TOP/BOTTOM SECTION 1 MAIN LUGS BEFORE MFGR.

1 TYPICAL PANELBOARD

NO SCALE



TYPE B

2 NAMEPLATE DETAIL

NO SCALE

1/8" HOLE FOR POP RIVET (2 PLACES)

AREA IN FRONT OF THIS ELECTRICAL PANEL MUST BE KEPT CLEAR FOR 36 INCHES OSHA-NEC REGULATIONS

TOP 3 ROWS: 3/4" LETTERS
BOTTOM ROW: 1/2" LETTERS

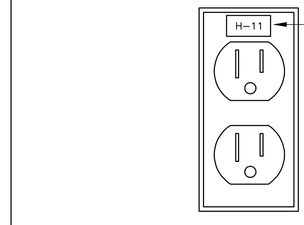
BLACK LETTERING ON WHITE BACKGROUND

NOTE:

INSTALL AT SELECTED AREAS WHERE SHOWN ON DRAWINGS AND WHERE POSSIBILTY OF BLOCKING IS ANTICIPATED AS IN STORAGE ROOMS.

3 OSHA/NEC PLACARD

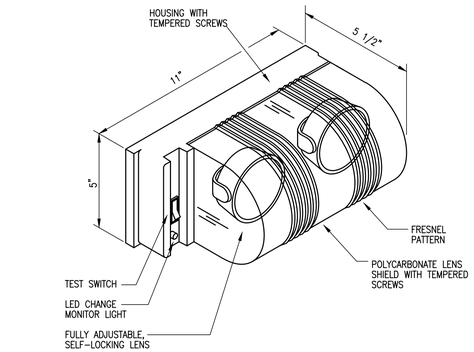
NO SCALE



MELAMINE PLASTIC LABEL
TYPICAL EXAMPLE:
"H-11" INDICATES SOURCE IS AT PANEL H, CIRCUIT #11, SHALL ALSO BE MARKED ON PANEL H SCHEDULE.

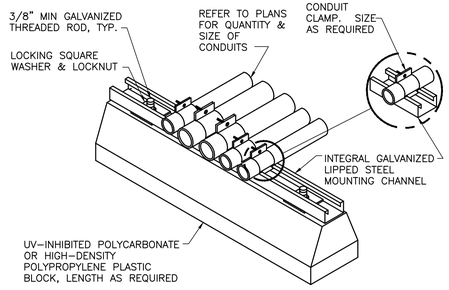
4 TYPICAL OUTLET LABEL DETAIL

NO SCALE



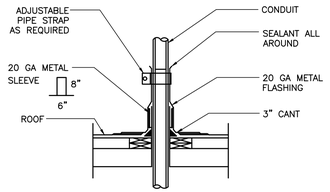
5 EMERGENCY LIGHT MOUNTING DETAIL

NO SCALE



6 TYPICAL ROOF CONDUIT SUPPORT DETAIL

NO SCALE

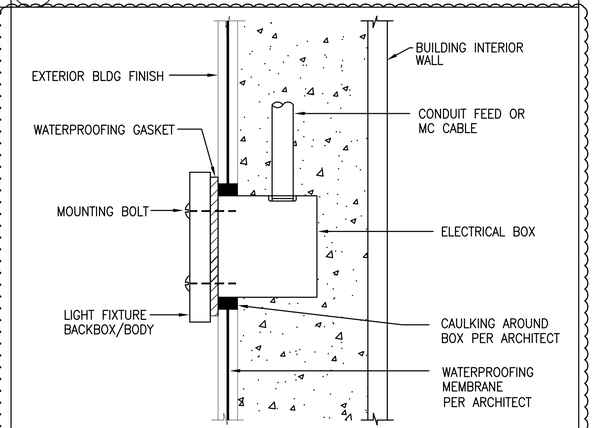


NOTE:

CONDUITS WHICH PASS THROUGH A ROOF SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS DETAIL

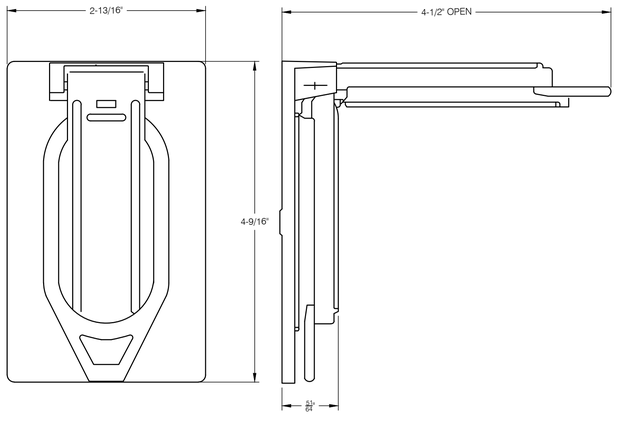
7 TYPICAL CONDUIT FLASHING

NO SCALE



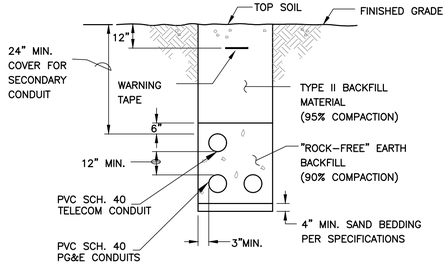
8 EXTERIOR LIGHT FIXTURE MOUNTING DETAIL

NO SCALE



9 WEATHERPROOF OUTLET DETAIL

NO SCALE



DIRECT BURIED DUCTBANK

INSTALLATION SHALL CONFORM TO PG&E REQUIREMENTS AND TELECOM PROVIDER

10 TYPICAL TRENCH DETAIL

NO SCALE

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SHEET TITLE

ELECTRICAL DETAILS

NO.	DATE	DESCRIPTION
1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RG
SCALE: AS SHOWN DATE: 11.30.2023

SHEET

E6.0

SECTION 16010: ELECTRICAL GENERAL PROVISIONS
PART I: GENERAL

1.01 CONDITIONS AND REQUIREMENTS

A. REFER TO THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT REQUIREMENTS AND DIVISION 1, GENERAL REQUIREMENTS.

B. THIS SECTION SUPPLEMENTS ALL SECTIONS OF DIVISION 16 AND SHALL APPLY TO ALL PHASES OF WORK HEREINAFTER SPECIFIED, SHOWN ON THE DRAWINGS, OR REQUIRED, TO PROVIDE A COMPLETE INSTALLATION OF ELECTRICAL SYSTEMS FOR THIS PROJECT.

1.02 DEFINITIONS (APPLICABLE TO DRAWINGS AND SPECIFICATIONS)

ABOVE GRADE: NOT BURIED IN GROUND AND NOT EMBEDDED IN CONCRETE SLAB ON GROUND.

BELOW GRADE: BURIED IN GROUND OR EMBEDDED IN CONCRETE SLAB IN GROUND.

CONCEALED: INSIDE BUILDING ABOVE GRADE AND LOCATED WITHIN WALLS, FURRED SPACES, CRAWL SPACES, ATTIC AND ABOVE SUSPENDED CEILINGS, ETC. IN GENERAL, ANY ITEM NOT VISIBLE OR DIRECTLY ACCESSIBLE.

CONNECT: COMPLETE HOOKUP OF ITEM WITH REQUIRED SERVICES, INCLUDING CONDUIT, WIRES AND OTHER ACCESSORIES.

CONTRACTOR: ELECTRICAL SUB-CONTRACTOR UNLESS STATED OTHERWISE.

EXPOSED: EITHER VISIBLE OR SUBJECT TO MECHANICAL OR WEATHER DAMAGE, INDOORS OR OUTDOORS, INCLUDING AREAS SUCH AS MECHANICAL AND STORAGE ROOMS. IN GENERAL, ANY ITEM THAT IS DIRECTLY ACCESSIBLE WITHOUT REMOVING PANELS, WALLS, CEILING OR OTHER PARTS OF STRUCTURE.

FURNISH: SUPPLY AND DELIVER COMPLETE.

INSTALL: PLACE, SECURE AND CONNECT AS REQUIRED TO MAKE FULLY OPERATIONAL.

PROVIDE: FURNISH AND INSTALL AS DEFINED ABOVE; PERFORM WORK.

UNDERGROUND: BURIED IN GROUND, INCLUDING UNDER BUILDING SLABS.

USE (VERB): FURNISH AND INSTALL AS DEFINED ABOVE.

WIRING: ELECTRICAL RACEWAY, CONDUCTOR AND CONNECTION.

1.03 SCOPE OF WORK

A. FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT AND PROVIDE ALL LABOR REQUIRED AND NECESSARY TO COMPLETE THE WORK SHOWN ON THE DRAWINGS AND/OR SPECIFIED IN DIVISION 16 AND ALL OTHER WORK AND MISCELLANEOUS ITEMS, NOT SPECIFICALLY MENTIONED, BUT REASONABLY INFERRED FOR A COMPLETE INSTALLATION, INCLUDING ALL ACCESSORIES AND APPURTENANCES REQUIRED FOR TESTING THE SYSTEM. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS THAT ALL SYSTEMS BE COMPLETE AND READY FOR OPERATION.

B. RELATED WORK SPECIFIED ELSEWHERE
   1. SEE HVAC: DRAWINGS AND SPECIFICATIONS.
   2. SEE PLUMBING: DRAWINGS AND SPECIFICATIONS.

1.04 CODE COMPLIANCE

A. ALL WORK AND MATERIALS SHALL COMPLY WITH THE LATEST RULES, CODES AND REGULATIONS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

1. OCCUPATIONAL SAFETY AND HEALTH ACT STANDARDS (OSHA).
2. NFPA #70: NATIONAL ELECTRIC CODE (NEC).
3. NFPA #101: LIFE SAFETY CODE.
4. ALL OTHER APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS.

B. CODE COMPLIANCE IS MANDATORY. NOTHING IN THESE DRAWINGS AND SPECIFICATIONS PERMITS WORK NOT CONFORMING TO THESE CODES. WHERE WORK IS SHOWN TO EXCEED MINIMUM CODE REQUIREMENTS, COMPLY WITH DRAWINGS AND SPECIFICATIONS.

C. NO WORK SHALL BE CONCEALED UNTIL AFTER INSPECTION AND APPROVAL BY PROPER AUTHORITIES. IF WORK IS CONCEALED WITHOUT INSPECTION AND APPROVAL, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK REQUIRED TO OPEN AND RESTORE THE CONCEALED AREAS IN ADDITION TO ALL REQUIRED MODIFICATIONS.

1.05 LICENSE, FEES AND PERMITS

A. ARRANGE FOR REQUIRED INSPECTIONS AND PAY ALL LICENSE, PERMIT AND INSPECTION FEES.

1.06 CONDITIONS AT SITE

A. VISIT TO SITE IS REQUIRED OF ALL BIDDERS PRIOR TO SUBMISSION OF BID. ALL WILL BE HELD TO HAVE FAMILIARIZED THEMSELVES WITH ALL DISCERNIBLE CONDITIONS AND NO EXTRA PAYMENT WILL BE ALLOWED FOR WORK REQUIRED BECAUSE OF THESE CONDITIONS, WHETHER SPECIFICALLY MENTIONED OR NOT.

B. LINES OF OTHER SERVICES THAT ARE DAMAGED AS A RESULT OF THIS WORK SHALL PROMPTLY BE REPAIRED AT NO EXPENSE TO THE OWNER TO COMPLETE SATISFACTION OF THE OWNER.

1.07 DRAWINGS AND SPECIFICATIONS

A. ALL DRAWINGS AND ALL DIVISIONS OF THESE SPECIFICATIONS SHALL BE CONSIDERED AS A WHOLE AND WORK OF THIS DIVISION SHOWN ANYWHERE THEREIN SHALL BE FURNISHED UNDER THIS DIVISION.

B. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT AND WIRING. MOST DIRECT ROUTING OF CONDUITS AND WIRING IS NOT ASSURED. EXACT REQUIREMENTS SHALL BE GOVERNED BY ARCHITECTURAL, STRUCTURAL AND MECHANICAL CONDITIONS OF THE JOB. CONSULT ALL OTHER DRAWINGS IN PREPARATION OF THE BID. EXTRA LENGTHS OF WIRING OR ADDITION OF PULL OR JUNCTION BOXES, ETC., NECESSITATED BY SUCH CONDITIONS SHALL BE INCLUDED IN THE BID. CHECK ALL INFORMATION AND REPORT ANY APPARENT DISCREPANCIES BEFORE SUBMITTING BID.

C. RIGHT IS RESERVED TO MAKE CHANGE UP TO TEN FEET IN LOCATION OF ANY OUTLET OR EQUIPMENT PRIOR TO ROUGHING-IN WITHOUT INCREASING CONTRACT COST.

D. EQUIPMENT AND FIXTURES SHALL BE CONNECTED TO PROVIDE CIRCUIT CONTINUITY IN ACCORDANCE WITH APPLICABLE CODES, WHETHER OR NOT EACH PIECE OF CONDUCTOR, CONDUIT OR PROTECTIVE DEVICE IS SHOWN BETWEEN ITEMS OF EQUIPMENT OR FIXTURES AND THE POINT OF CIRCUIT ORIGIN.

1.08 SAFETY AND INDEMNITY

A. SAFETY: THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

B. NO ACT, SERVICE, DRAWING REVIEW OR CONSTRUCTION REVIEW BY OWNER, THE ARCHITECT, THE ENGINEERS OR THEIR CONSULTANTS, IS INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.

1.09 RECORD DRAWINGS

A. CONTRACTOR SHALL OBTAIN A COMPLETE RECORD SET OF REPRODUCIBLE TRANSPARENCIES FROM THE ARCHITECT. THIS SHALL BE CORRECTED DAILY TO SHOW ALL CHANGES FROM ORIGINAL CONTRACT DRAWINGS AND SHALL BE KEPT ON THE JOB. THIS SET OF REPRODUCIBLES, CLEARLY AND NEATLY MARKED, SHALL BE DELIVERED TO THE ARCHITECT UPON COMPLETION OF THE JOB.

1.10 GUARANTEE

A. GUARANTEE THE INSTALLATION FREE FROM DEFECTS OF WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER DATE OF CERTIFICATE OF FINAL PAYMENT AND PROMPTLY REMEDY ANY DEFECTS DEVELOPING DURING THIS PERIOD, WITHOUT CHARGE.

PART II: PRODUCTS

2.01 MATERIAL APPROVAL

A. ALL MATERIALS MUST BE NEW AND BEAR UNDERWRITERS' LABORATORIES LABEL. MATERIALS THAT ARE NOT COVERED BY UL TESTING STANDARDS SHALL BE TESTED AND APPROVED BY AN INDEPENDENT TESTING LABORATORY OR A GOVERNMENTAL AGENCY.

B. MATERIAL NOT IN ACCORDANCE WITH THESE SPECIFICATIONS MAY BE REJECTED EITHER BEFORE OR AFTER INSTALLATION.

2.02 SUBSTITUTIONS

A. WHEREVER POSSIBLE, MORE THAN ONE MANUFACTURER HAS BEEN LISTED FOR VARIOUS ITEMS OF EQUIPMENT, ANY ONE OF WHICH WILL BE ACCEPTABLE. BASE THE BID ON USE OF MATERIALS SPECIFIED. IF, AFTER AWARD OF THE CONTRACT, A SUBSTITUTE IS PROPOSED, THE REQUEST FOR PERMISSION TO SUBSTITUTE SHALL BE ACCOMPANIED WITH A STATEMENT OF THE AMOUNT OF MONEY TO BE RETURNED TO THE CONTRACT IF THE SUBSTITUTION IS PERMITTED. THE ARCHITECT IS THE SOLE JUDGE OF ACCEPTABILITY OF PREFERRED SUBSTITUTIONS. IF A SUBSTITUTE IS PERMITTED, AND ANY RE-DESIGN EFFORT IS THEREBY NECESSITATED, THE REQUIRED RE-DESIGN SHALL BE AT THE CONTRACTOR'S EXPENSE.

2.03 SUBMITTALS

A. SUBMIT TO ARCHITECT SEVEN (7) COPIES OF COMPLETE SHOP DRAWINGS AND MATERIALS LISTS, AS NOTED BELOW, FOR REVIEW WITHIN THIRTY (30) DAYS AFTER AWARD OF CONTRACT. ALL PROPOSED DEVIATIONS FROM SPECIFICATIONS MUST BE CLEARLY LISTED UNDER A PROMINENT HEADING ENTITLED "DEVIATIONS."

B. SUBMITTALS REQUIRED AS FOLLOWS:

1. MATERIALS LIST: IDENTIFYING INFORMATION COVERING ALL ELECTRICAL MATERIALS.
2. SPLICE BOXES AND MANHOLES: DETAILED DRAWINGS INCLUDING ALL DIMENSIONS.
3. PANELBOARDS AND SWITCHBOARDS: COMPLETE SHOP DRAWINGS.
4. LIGHTING FIXTURES: CATALOG CUTS AND PHOTOMETRIC DATA.

2.04 OPERATING AND MAINTENANCE MATERIALS

A. SUBMIT OPERATING AND MAINTENANCE MANUALS OF EQUIPMENT AS SPECIFIED UNDER DIVISION 1. VERIFY EXACT QUANTITY WITH ARCHITECT.

2.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. DELIVER AND HANDLE MATERIALS IN A MANNER TO PREVENT DAMAGE.

B. STORE AND PROTECT EQUIPMENT FROM WEATHER AND DAMPNESS.

PART III: EXECUTION

3.01 WORKMANSHIP AND CONTRACTOR'S QUALIFICATIONS

A. ONLY QUALITY WORKMANSHIP WILL BE ACCEPTED. HAPHAZARD OR POOR INSTALLATION PRACTICE WILL BE CAUSE FOR REJECTION OF WORK.

B. PROVIDE FOREMAN IN CHARGE OF THIS WORK AT ALL TIMES.

3.02 COORDINATION

A. COORDINATE WORK WITH OTHER TRADES TO AVOID CONFLICT AND TO PROVIDE CORRECT ROUGH-IN AND CONNECTION FOR EQUIPMENT FURNISHED UNDER OTHER TRADES THAT REQUIRE ELECTRICAL CONNECTIONS. INFORM CONTRACTORS OF OTHER TRADES OF THE REQUIRED ACCESS TO AND CLEARANCES AROUND ELECTRICAL EQUIPMENT TO MAINTAIN SERVICABILITY AND CODE COMPLIANCE.

B. VERIFY EQUIPMENT DIMENSIONS AND REQUIREMENTS WITH PROVISIONS SPECIFIED UNDER THIS SECTION. CHECK ACTUAL JOB CONDITIONS BEFORE FABRICATING WORK. REPORT NECESSARY CHANGES IN TIME TO PREVENT NEEDLESS WORK. CHANGES OR ADDITIONS SUBJECT TO ADDITIONAL COMPENSATION AND AGREED PRICE, SHALL BE AT CONTRACTOR'S RISK AND EXPENSE.

C. VERIFY WITH UTILITIES COMPANY AND TELEPHONE COMPANY FOR ALL REQUIREMENTS. ARRANGE WITH THEM SCHEDULING AND COORDINATION NECESSARY FOR PROVIDING SERVICE AND MAKING CONNECTIONS.

3.03 CUTTING AND PATCHING

A. ALL CUTTING AND PATCHING REQUIRED FOR WORK OF THIS DIVISION IS INCLUDED HEREIN. COORDINATION WITH GENERAL CONTRACTOR AND OTHER TRADES IS IMPERATIVE. CONTRACTOR SHALL BEAR THE RESPONSIBILITY FOR AND THE ADDED EXPENSE OF ADJUSTING FOR IMPROPER HOLES, SUPPORTS, ETC.

3.04 EXCAVATION AND BACKFILL

A. ALL EXCAVATION AND BACKFILL REQUIRED BECAUSE OF THIS WORK SHALL BE INCLUDED. TRENCHES SHALL BE CUT STRAIGHT AND TRUE AND SHALL BE SHORED AND BRACED WHERE REQUIRED.

3.05 EXISTING UNDERGROUND UTILITIES AND SERVICES

A. LOCATIONS OF EXISTING UTILITIES, WHERE SHOWN, WERE ESTABLISHED FROM BEST POSSIBLE INFORMATION. ASSUME THAT THIS INFORMATION IS APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS BEFORE STARTING WORK. SHOULD, DURING THE COURSE OF THE WORK, CONDITIONS ARISE THAT INDICATE CONDITIONS ARE OTHER THAN INDICATED, NOTIFY ARCHITECT IMMEDIATELY. USE EXTREME CAUTION SO AS NOT TO DAMAGE OR BREAK LINES THAT ARE IN USE. IF BREAKAGE DOES OCCUR, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE AND REPAIRS RESULTING THEREFROM. ALL UNUSUAL CONDITIONS WITH RESPECT TO EXISTING FACILITIES SHALL BE BROUGHT TO ARCHITECT'S ATTENTION IMMEDIATELY.

3.06 CONNECTIONS TO EXISTING WORK

A. INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. ALL EXISTING SERVICE INTERRUPTIONS SHALL BE HELD TO A MINIMUM. INTERRUPTIONS MUST BE SCHEDULED IN ADVANCE WITH OWNER TO SUIT HIS CONVENIENCE. DURATION OF INTERRUPTIONS SHALL BE AS AGREE WITH OWNER AND ARCHITECT. OWNER RESERVES THE RIGHT TO REQUIRE THAT NECESSARY INTERRUPTIONS BE AT TIMES OTHER THAN USUAL BUSINESS HOURS. CONTRACTOR SHALL FOLLOW THE APPROVED WORK PHASING SEQUENCE AS DIRECTED BY THE OWNER AND ARCHITECT. MAINTAIN CONTINUOUS OPERATIONS OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

3.07 ACCEPTANCE DEMONSTRATION

A. UPON COMPLETION OF WORK, AT A TIME TO BE DESIGNATED BY THE OWNER, THE CONTRACTOR SHALL DEMONSTRATE FOR THE OWNER THE OPERATION OF THE ELECTRICAL INSTALLATION, INCLUDING ANY AND ALL SPECIAL ITEMS INSTALLED BY HIM OR INSTALLED UNDER HIS SUPERVISION.

3.08 FIELD TEST AND OPERATIONAL CHECK

A. ARRANGEMENTS FOR A FINAL TEST AND INSPECTION OF COMPLETED SYSTEMS BY THE ARCHITECT SHALL INCLUDE:

1. DEMONSTRATION THAT ALL CIRCUITS, LIGHTS AND EQUIPMENT OPERATE SATISFACTORILY AND AS CALLED FOR, WITH FIXTURES AND EQUIPMENT/DEVICES CONNECTED.
2. VERIFICATION OF PROPER DIRECTION OF ROTATION OF ALL MOTORS.
3. INSPECTION OF ALL EQUIPMENT AND INTERIOR OF ALL SWITCHBOARDS, PANELS, CABINETS, HANDHOLES AND OTHER ITEMS AS APPLICABLE.
4. SPOT CHECK VERIFICATION OF COLOR CODING, TAGGING, NUMBERING AND SPLICE MAKE UP.

B. CONTRACTOR SHALL PERFORM INSULATION TEST OF ALL BRANCH CIRCUITS AND OPERATIONAL CHECK OF ALL SYSTEMS.

C. PERFORM UNDER FULL LOAD CONDITIONS AND IN PRESENCE OF ARCHITECT OR OWNER.

D. GROUND RESISTANCE TEST: SHALL BE ACCOMPLISHED WITH A GROUND RESISTANCE DIRECT-READING SINGLE TEST METER UTILIZING THE FALL-OF-POTENTIAL METHOD AND TWO REFERENCE ELECTRODES. PERFORM TEST PRIOR TO INTERCONNECTION OF THE GROUND RODS TO OTHER GROUNDING SYSTEMS. GROUND RESISTANCE SHOULD BE 5 OHMS MAXIMUM. PROVIDE ADDITIONAL GROUND RODS IF REQUIRED.

END OF SECTION

SECTION 16040
FIELD TEST AND OPERATIONAL CHECK

PART 1: GENERAL

1.01 CONDITIONS AND REQUIREMENTS

A. REFER TO THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT REQUIREMENTS AND DIVISION 1 – GENERAL REQUIREMENTS.

B. REFER TO SECTION 16010, ELECTRICAL GENERAL PROVISIONS.

1.02 DESCRIPTION

A. WORK INCLUDED IN THIS SECTION:

1. GROUND RESISTANCE TEST.
2. TRANSFORMER AND EXISTING SWITCHBOARD OPERATIONAL CHECK.

1.03 GENERAL SCOPE

A. THE CONTRACTOR SHALL ENGAGE AND PAY FOR THE SERVICES OF A RECOGNIZED INDEPENDENT TESTING LABORATORY FOR THE PURPOSE OF PERFORMING INSPECTIONS AND TESTS AS HEREIN SPECIFIED.

B. THE TESTING LABORATORY SHALL PROVIDE ALL MATERIAL, EQUIPMENT, LABOR AND TECHNICAL SUPERVISION TO PERFORM SWITCH TESTS AND INSPECTIONS.

C. IT IS THE INTENT OF THESE TESTS TO ASSURE THAT ALL ELECTRICAL EQUIPMENT, BOTH CONTRACTOR AND OWNER-SUPPLIED, IS OPERATIONAL WITHIN INDUSTRY AND MANUFACTURER'S TOLERANCES AND IS INSTALLED IN ACCORDANCE WITH DESIGN SPECIFICATIONS.

D. THE TESTS AND INSPECTIONS SHALL DETERMINE THE SUITABILITY FOR ENERGIZATION.

E. SCHEDULE TESTS AND GIVE A MINIMUM OF TWO WEEKS ADVANCE NOTICE TO THE OWNER'S REPRESENTATIVE.

1.04 QUALIFICATIONS OF TESTING AGENCY

A. THE TESTING AGENCY SHALL MEET FEDERAL OSHA CRITERIA FOR ACCREDITATION OF TESTING LABORATORIES, TITLE 29, PART 1907. MEMBERSHIP IN THE NATIONAL ELECTRICAL TESTING ASSOCIATION CONSTITUTES PROOF OF MEETING SUCH CRITERIA.

1.05 TEST INSTRUMENT TRACEABILITY

A. THE TESTING LABORATORY SHALL HAVE A CALIBRATION PROGRAM WHICH MAINTAINS ALL APPLICABLE TEST INSTRUMENTATION WITHIN RATED ACCURACY.

B. THE ACCURACY SHALL BE TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS IN AN UNBROKEN CHAIN.

C. INSTRUMENTS SHALL BE CALIBRATED IN ACCORDANCE WITH THE FOLLOWING FREQUENCY SCHEDULE:

1. FIELD INSTRUMENTS: 6 MONTHS MAXIMUM.
2. LABORATORY INSTRUMENTS: 12 MONTHS.
3. LEASED SPECIALTY EQUIPMENT: 12 MONTHS, (WHERE ACCURACY IS GUARANTEED BY LESSOR, I.E., DOBLE).

D. DATED CALIBRATION LABELS SHALL BE VISIBLE ON ALL TEST EQUIPMENT.

1.06 FINAL SETTINGS

A. THE TEST REPORT SHALL INCLUDE THE FOLLOWING:

1. SUMMARY OF PROJECT.
2. DESCRIPTION OF EQUIPMENT TESTED.
3. DESCRIPTION OF TEST.
4. LIST OF TEST EQUIPMENT USED IN CALIBRATION AND CALIBRATION DATE.
5. TEST RESULTS.
6. CONCLUSIONS AND RECOMMENDATIONS.
7. APPENDIX, INCLUDING APPROPRIATE TEST FORMS.

B. THE TEST REPORT SHALL BE BOUND AND ITS CONTENTS CERTIFIED.

C. SUBMIT THREE COPIES OF THE COMPLETED REPORT TO THE OWNER'S REPRESENTATIVE NO LATER THAN FIFTEEN DAYS AFTER COMPLETION OF TEST, UNLESS OTHERWISE DIRECTED.

1.07 FAILURE TO TEST

A. ANY SYSTEM MATERIAL OR WORKMANSHIP WHICH IS FOUND DEFECTIVE ON THE BASIS OF ACCEPTANCE TESTS SHALL BE REPORTED DIRECTLY TO THE OWNER'S REPRESENTATIVE.

B. CONTRACTOR SHALL REPLACE THE DEFECTIVE MATERIAL OR EQUIPMENT AND HAVE TEST REPEATED UNTIL TEST PROVES SATISFACTORY WITHOUT ADDITIONAL COST TO THE OWNER.

PART 2: PRODUCTS

PART 3: EXECUTION

3.01 GROUND RESISTANCE TEST

A. BUILDING GROUND ELECTRODE RESISTANCE TESTING SHALL BE ACCOMPLISHED WITH A GROUND RESISTANCE, DIRECT-READING, SINGLE TEST METER UTILIZING THE FALL-OF-POTENTIAL METHOD AND TWO REFERENCED ELECTRODES. PERFORM TEST PRIOR TO INTERCONNECTION TO OTHER GROUNDING SYSTEM. ORIENT THE CONCRETE-ENCASED GROUND ELECTRODE TO BE TESTED AND THE TWO REFERENCED ELECTRODES IN STRAIGHT LINE SPACES FIFTY (50) FEET APART. DRIVE THE TWO REFERENCE ELECTRODES TEN (10 FEET DEEP.

B. TEST RESULTS SHALL BE IN WRITING, AND SHALL SHOW TEMPERATURE, HUMIDITY AND CONDITION OF THE SOIL AT THE TIME OF THE TESTS. IN THE CASE WHERE THE GROUND RESISTANCE EXCEEDS 2 OHMS, OWNER WILL ISSUE ADDITIONAL INSTRUCTIONS.

3.02 TRANSFORMER AND BREAKER OPERATIONAL CHECK

A. CHECK CLEANLINESS OF ALL INTERIORS AND ALL PARTS. REMOVE ANY EXCESS PACKING, SHIPPING BOLTS, ETC.

B. TIGHTEN ALL POINTS OF CONNECTION WITH TORQUE WRENCH TO VALUES RECOMMENDED BY THE MANUFACTURER.

C. VERIFY PROPER OPERATING CONDITION OF ALL EQUIPMENT MECHANICALLY AND ELECTRICALLY INCLUDING, BUT NOT LIMITED TO:

1. WIRING FOR ALL METERS AND INSTRUMENTATION.
2. VERIFY RELAY OPERATIONS BY INTRODUCTION OF ACCURATELY METERED CURRENTS INTO BOTH OVER-CURRENT AND GROUND FAULT CIRCUITRY AT VALUES WHICH WILL ENABLE ACCURATE DETERMINATION OF THE TRIPPING CHARACTERISTICS.

D. IF ANY EQUIPMENT IS FOUND DEFECTIVE DURING OPERATIONAL CHECK, IT SHALL BE REPLACED BY THE CONTRACTOR WITHOUT COST TO THE OWNER, THE TESTS REPEATED BY THE CONTRACTOR WITHOUT COST TO THE OWNER AND REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

END OF SECTION

SECTION 16050
BASIC MATERIALS AND METHODS

PART I: GENERAL

1.01 CONDITIONS AND REQUIREMENTS

A. REFER TO THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT REQUIREMENTS AND DIVISION 1, GENERAL REQUIREMENTS.

B. REFER TO SECTION 16010, ELECTRICAL GENERAL PROVISIONS.

1.02 DESCRIPTION

A. WORK INCLUDED IN THIS SECTION IS CONDUITS, WIRES AND OTHER MISCELLANEOUS MATERIALS NOT SPECIFICALLY MENTIONED IN OTHER SECTIONS OF DIVISION 16, BUT NECESSARY OR REQUIRED FOR EQUIPMENT OR SYSTEM OPERATION OR FUNCTION, AND THE LABOR TO INSTALL THEM.

B. RELATED WORK: OTHER SECTIONS OF DIVISION 16.

PART II: PRODUCTS

2.01 CONDUITS AND OTHER RACEWAYS

A. RIGID STEEL: HOT-DIPPED GALVANIZED OR SHERARDIZED.

B. INTERMEDIATE METAL CONDUIT (IMC): ELECTRO-GALVANIZED OR SHERARDIZED.

C. ELECTRICAL METAL TUBING (EMT): ELECTRO-GALVANIZED OR SHERARDIZED.

D. PLASTIC: SCHEDULE 40 PVC, APPROVED FOR USE AS NON-METALLIC RACEWAY FOR 90 DEGREE C. CONDUCTORS. CARLON, CERTAINTEED OR KALROY.

E. WIREWAY: CODE GAUGE STEEL, WITH KNOCKOUTS AND HINGED COVER. CORROSION RESISTANT GRAY BAKED ENAMEL FINISH.

F. PROVIDE FITTINGS AND ACCESSORIES APPROVED FOR THE PURPOSE EQUAL IN ALL RESPECTS TO THE CONDUIT OR RACEWAY. EMT CONNECTORS AND COUPLINGS SHALL BE STEEL COMPRESSION TYPE.

2.02 WIRES AND CABLES

A. FOR POWER AND LIGHTING SYSTEMS 600V OR LESS:

1. CONDUCTOR: #12 AND #10 AWG SOLID COPPER. #8 AWG AND LARGER SHALL BE STRANDED COPPER.

2. INSULATION TYPE: #12 TO #1 AWG SHALL BE THWN FOR WET OR UNDERGROUND LOCATIONS AND THHN FOR DRY LOCATIONS. #1/0 THROUGH #4/0 AWG SHALL BE TYPE XHHW (55 MILS). #250 MCM AND LARGER SHALL BE TYPE XHHW (65 MILS). GROUNDING WIRE SHALL BE TYPE THWN.

3. MINIMUM CONDUCTOR SIZE:

   A. MINIMUM SIZE: #12 AWG FOR 120/208V CIRCUIT RUNS LESS THAN 100 FEET (200 FEET FOR 277/480V SYSTEMS).

   B. RUNS OVER 100 FEET FOR 120/208V SYSTEM (OR 200 FEET FOR 277/480V SYSTEM) SHALL BE #10 AWG OR LARGER AS DIRECTED BY NEC VOLTAGE DROP RESTRICTIONS.

   C. UNDERGROUND CIRCUITS SHALL USE #10 AWG MINIMUM WIRES UNLESS OTHERWISE NOTED.

B. FOR SIGNAL AND COMMUNICATIONS CIRCUITS:

1. SPECIAL CABLES SHALL BE AS SPECIFIED ON DRAWINGS.

2. CONDUCTORS FOR GENERAL USE SHALL BE STRANDED COPPER CONDUCTOR, #16 AWG MINIMUM, WITH THWN INSULATION FOR UNDERGROUND OR WET LOCATIONS AND THHN INSULATION FOR DRY LOCATIONS.

C. ACCEPTABLE PRODUCTS: GENERAL ELECTRIC, ANACONDA, OKONITE, PARANITE, PIRELLI-GENERAL OR TRIANGLE PRODUCTS CONFORMING TO OR EXCEEDING APPLICABLE IPCEA STANDARDS.

2.03 OUTLET BOXES, JUNCTION BOXES AND PULL BOXES

A. OUTLET BOXES: HOT-DIPPED, GALVANIZED OR SHERARDIZED OF REQUIRED SIZE, 4" SQUARE, MINIMUM, FOR FLUSH MOUNTED DEVICES AND LIGHTING FIXTURES. CAST TYPE WITH GASKETED COVERS FOR OUTDOORS OR WET LOCATIONS.

B. JUNCTION AND PULL BOXES: USE OUTLET BOXES WITH APPROPRIATE COVERS AS JUNCTION BOXES WHEREVER POSSIBLE. LARGER JUNCTION AND PULL BOXES SHALL BE FABRICATED FROM SHEET STEEL, SIZED ACCORDING TO CODE, WITH SCREW-ON COVERS, FINISHED GRAY BAKED ENAMEL.

2.04 WIRE DEVICES

A. DUPLEX CONVENIENCE RECEPTACLES: 3-POLE GROUNDED "STYLE-LINE" SERIES 21, RATED 20 AMPERES, 125V HUBBELL #2162 SERIES.

B. DEVICE PLATES: NYLON " STYLE-LINE" SERIES FOR FLUSH WITH COLOR AS SELECTED BY ARCHITECT AND GALVANIZED STEEL FOR SURFACE MOUNTED DEVICES EXCEPT CERTAIN AREAS MAY REQUIRE IVORY OR BROWN BAKELIGHT PLATES AND DEVICES. CONFIRM FINISHES WITH ARCHITECT BEFORE ORDERING. WEATHERPROOF PLATES SHALL BE WITH HINGED COVER, HUBBELL "RCV" SERIES.

2.05 CONDUIT HANGERS

A. FOR INDIVIDUAL CONDUIT RUNS NOT DIRECTLY FASTENED TO THE STRUCTURE, USE ROD HANGERS MANUFACTURED BY CADDY, UNISTRUT OR POWERSTRUT.

B. FOR MULTIPLE CONDUIT RUNS, USE UNISTRUT OR POWERSTRUT TRAPEZE TYPE CONDUIT SUPPORT DESIGNED FOR MAXIMUM DEFLECTION NOT GREATER THAN 1/8".

2.06 WIRE CONNECTORS

A. FOR WIRES SIZE #8 AWG AND SMALLER: INSULATED PRESSURE TYPE (WITH LIVE SPRING) RATED 105 DEGREES C., 600V FOR BUILDING WIRING AND 1000V IN SIGNS OR FIXTURES. SCOTCHLOK OF IDEAL.

2.07 TERMINAL CABINETS

A. FABRICATED FORM CODE GAUGE STEEL, SIZE AS INDICATED ON DRAWINGS, WITH FLUSH LATCH AND CONCEALED HINGES. WHERE SIZE IS NOT INDICATED, MINIMUM SIZE SHALL BE 24"W X 30"H X 5"D. FINISH SHALL BE ANSI 61 LIGHT GRAY ENAMEL.

B. PROVIDE INSIDE TERMINAL CABINET 3/4" THICK PLYWOOD BACKBOARD AND TERMINAL STRIPS, ONE TERMINAL POINT FOR EACH WIRE WITHIN THE TERMINAL CABINET

2.08 MISCELLANEOUS MATERIALS

A. HANDHOLES: SHALL BE SIZED AS INDICATED, PRE-CAST CONCRETE TYPE WITH STRUCTURALLY REINFORCED ROADWAY TYPE BOLT-DOWN GALVANIZED STEEL COVERS AND REQUIRED EXTENSION COLLARS. UNITS SHALL BE PROVIDED WITH CONCRETE BOTTOMS AND SUMPS. HANDHOLES SHALL BE LEFT IN A CLEAN CONDITION WITH ALL DEBRIS REMOVED AND WITH ALL CABLES SUPPORTED ON APPROVED CABLE SUPPORTS. ALL STUBS FOR HANDHOLES SHALL BE CONCRETE ENCASED AND SHALL EXTEND 5 FEET BEYOND HANDHOLE. BROOKS, CHRISTY OR QUICKSET.

PART III: EXECUTION

3.01 GENERAL

A. ELECTRIC SYSTEM LAYOUTS INDICATED ON THE DRAWINGS ARE GENERALLY DIAGRAMMATIC, BUT SHALL BE FOLLOWED CLOSELY AS ACTUAL CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. GOVERN EXACT ROUTING OF CABLE AND WIRING AND THE LOCATIONS OF OUTLETS BY THE STRUCTURE AND EQUIPMENT SERVED. TAKE ALL DIMENSIONS FROM ARCHITECTURAL DRAWINGS.

B. CONSULT ALL OTHER DRAWINGS. VERIFY SCALES AND REPORT ANY DIMENSIONAL DISCREPANCIES OR OTHER CONFLICTS TO ARCHITECT BEFORE SUBMITTING BID.

C. ALL HOME RUNS TO PANELBOARDS ARE INDICATED AS STARTING FROM THE OUTLET NEAREST THE PANEL AND CONTINUING IN THE GENERAL DIRECTION OF THAT PANEL. CONTINUE SUCH CIRCUITS TO THE PANEL AS THOUGH THE ROUTES WERE COMPLETELY INDICATED. TERMINATE HOME- RUNS OF SIGNAL, ALARM AND COMMUNICATIONS SYSTEMS IN A SIMILAR MANNER.

D. AVOID CUTTING AND BORING HOLES THROUGH STRUCTURE OR STRUCTURAL MEMBERS WHEREVER POSSIBLE. OBTAIN PRIOR APPROVAL OF ARCHITECT AND CONFORM TO ALL STRUCTURAL REQUIREMENTS WHEN CUTTING OR BORING THE STRUCTURE IS NECESSARY AND PERMITTED.

E. FURNISH AND INSTALL ALL NECESSARY HARDWARE, HANGERS, BLOCKING, BRACKETS, BRACING RUNNERS, ETC., REQUIRED FOR EQUIPMENT SPECIFIED UNDER THIS SECTION.

F. PROVIDE NECESSARY BACKING REQUIRED TO INSURE RIGID MOUNTING OF OUTLET BOXES.

3.02 WIRING METHOD

A. INSTALL ALL WIRING IN RACEWAY, UNLESS SPECIFICALLY SHOWN OTHERWISE.

B. MINIMUM CONDUIT SIZE SHALL BE 1/2" WHEN INSTALLED ABOVE GROUND AND 3/4" WHEN INSTALLED UNDERGROUND OR UNDER BUILDING SLABS. INCREASE CONDUIT SIZE AS REQUIRED FOR WIRING. SIZE FOR CONDUIT, UNLESS SPECIFICALLY SHOWN OTHERWISE, SHALL BE DETERMINED FROM TABLE 3A FOR CONDUCTORS #16 THROUGH #4/ AWG AND TABLE 3C FOR CONDUCTORS 250 MCM OR LARGER, CHAPTER 9 OF LATEST NATIONAL ELECTRICAL CODE.

C. CONDUIT SHALL BE RIGID STEEL, IMC, EMT OR PLASTIC AS FOLLOWS:

1. ABOVE GROUND: USE RIGID STEEL OR IMC ONLY.
   A. WET LOCATIONS: RIGID STEEL OR IMC ONLY.
   B. HAZARDOUS LOCATIONS: RIGID STEEL CONFORMING TO NEC REQUIREMENTS.
   C. LOCATIONS SUBJECT TO MECHANICAL INJURY: RIGID STEEL OR IMC ONLY.
   D. IN CONCRETE WALLS OR BLOCK WALLS: RIGID STEEL ONLY OR IMC ONLY.
   E. DRY LOCATIONS AND NOT SUBJECT TO MECHANICAL INJURY: EMT, IMC OR RIGID STEEL CONDUIT.
2. UNDERGROUND: USE RIGID STEEL OR PLASTIC.
   A. RIGID STEEL CONDUIT SHALL BE ENCASED IN 3" MINIMUM CONCRETE ENVELOPE AND MAY BE USED FOR ALL SERVICES.
   B. PLASTIC CONDUIT 2" OR GREATER SHALL BE INSTALLED AS DIRECTED ON PLANS.
   C. PLASTIC CONDUIT 1-1/2" SIZE AND SMALLER SHALL BE INSTALLED ON 3" SAND BASE AND COVERED BY 3" SAND BACKFILL. IN PLANTING AREAS, PROVIDE 2" CONCRETE CAP. MULTIPLE RUNS SHALL MAINTAIN 3" MINIMUM SEPARATION BETWEEN RUNS.
3. MAKE ALL RISERS TO GRADE WITH RIGID STEEL CONDUIT AND RIGID STEEL ELBOW FITTINGS ONLY. CONCRETE ENCASE UNDERGROUND PORTION OF STEEL CONDUIT OR FITTINGS.
4. BURIAL DEPTH OF CONDUITS SHALL BE AS FOLLOWS:
   A. CONCRETE ENCASED: 24" MINIMUM FOR 600V OR LOWER SYSTEMS TO TOP OF CONCRETE ENCASEMENT.
   B. CONCRETE CAPPED: 24" MINIMUM TO TOP OF CONDUIT.
   C. CONDUITS WITHOUT CONCRETE ENCASEMENT OR CAP: 24" MINIMUM TO TOP OF CONDUIT.
   D. WHEN INSTALLED UNDER BUILDINGS THE ABOVE MINIMUM DEPTH SHALL BE 18" BELOW BOTTOM OF FLOOR SLAB.

D. PROVIDE ALL JUNCTION BOXES/PULL BOXES AS REQUIRED TO LIMIT ANY POWER SYSTEM CONDUIT RUN TO A MAXIMUM OF FOUR 90 DEGREE BENDS (TWO 90 DEGREE BENDS FOR TELEVISION CABLE CONDUIT RUNS) OR TO AVOID "U" BENDS.

3.03 INSTALLATION OF CONDUITS

A. GENERAL:

1. RUN ALL CONDUITS CONCEALED UNLESS OTHERWISE NOTED OR SHOWN.
2. RUN EXPOSED CONDUIT PARALLEL TO OR AT RIGHT ANGLES TO CENTER LINES OF COLUMNS AND BEAMS.
3. RUN NO CONDUIT IN CONCRETE SLABS OR FLOORS EXCEPT AT POINT OF PENETRATION. ALL PENETRATIONS SHALL BE AT RIGHT ANGLES TO SLAB SURFACES.
4. INSTALL CONDUITS ABOVE CEILINGS TO AVOID OBSTRUCTING REMOVAL OF CEILING TILES, LIGHTING FIXTURES, AIR DIFFUSERS, ETC.
5. CONDUITS SHALL NOT CROSS ANY DUCT SHAFT OR AREA DESIGNATED AS FUTURE DUCT SHAFT HORIZONTALLY. CONDUIT RISES WHEN ALLOWED IN DUCT SHAFT MUST BE COORDINATED WITH MECHANICAL WORK TO AVOID ANY CONFLICT.

B. CONDUIT SUPPORTS:

1. SUPPORT CONDUITS WITH UNDERWRITERS' LABORATORIES LISTED STEEL CONDUIT SUPPORT INTERVALS REQUIRED BY THE NATIONAL ELECTRIC CODE. WIRES OR SHEET METAL STRIPS ARE NOT ACCEPTABLE FOR CONDUIT SUPPORT. USE CONDUIT HANGERS FOR ALL CONDUITS NOT DIRECTLY FASTENED TO STRUCTURE AND FOR ALL MULTIPLE CONDUIT RUNS.
2. INDIVIDUAL CONDUITS 1/2" AND 3/4" SIZE MAY BE SUPPORTED FROM CEILING SUPPORT WIRES WITH CADDY CLIPS ONLY IF ACCEPTABLE TO LOCAL CODE. ONLY ONE CONDUIT IS PERMITTED TO BE ATTACHED TO ANY CEILING SUPPORT WIRE. HANG SUCH CONDUIT SO AS NOT TO AFFECT LEVEL OF CEILING.
3. AVOID ATTACHING CONDUIT TO FAN PLENUMS. WHEN IT IS NECESSARY TO SUPPORT CONDUIT FROM FAN PLENUM, PROVIDE A LENGTH OF FLEXIBLE CONDUIT BETWEEN PORTION ATTACHED TO THE FAN PLENUM AND PORTION ATTACHED TO THE BUILDING TO MINIMIZE TRANSMISSION OF VIBRATION TO THE BUILDING STRUCTURE.

C. CONDUIT PENETRATIONS CONDUIT PENETRATIONS OF ROOF, WALLS, FLOORS AND CEILINGS SHALL BE SEALED TO PRESERVE THE INTEGRITY OF WATERPROOFING, FIRE RATING AND SOUNDPROOFING FOR WHICH THE ROOF, WALL, FLOOR OR CEILING IS DESIGNED. MATERIALS AND METHODS USED SHALL CONFORM TO THAT SPECIFIED UNDER ARCHITECTURAL SECTIONS.

D. ALL UNDERGROUND CONDUITS AND DUCTS 2" AND LARGER SHALL BE PROVEN CLEAR BY PULLING THROUGH A MANDREL 1/4" SMALLER THAN THE INSIDE DIAMETER.

E. WHERE FLUSH BRANCH CIRCUIT PANELBOARDS OR TERMINAL CABINETS ARE SHOWN ON WALLS, STUB A MINIMUM OF FOUR 1" EMPTY CONDUITS INTO OVERHEAD CEILING SPACES AND FOUR 1" ADDITION TO CONDUITS REQUIRED FOR CIRCUIT WIRING.

3.04 CONCRETE DUCT BANK CONSTRUCTION

A. PROVIDE PLASTIC SPACERS AT MAXIMUM 5"-0" CENTERS TO MAINTAIN 3" SPACING BETWEEN CONDUITS. DRIVE TWO REINFORCING BARS TO ANCHOR THE CONDUITS AT 10'-0" ON CENTERS TO PREVENT FLOATING DURING CONCRETE POUR WHEN INSTALLED UNDER ROADWAYS, PROVIDE REINFORCING BARS AS SHOWN ON DRAWINGS.

3.05 INSTALLATION OF WIRES

A. PULL NO WIRE INTO ANY OF THE CONDUIT SYSTEM UNTIL ALL CONSTRUCTION WORK WHICH MAY DAMAGE THE WIRE HAS BEEN COMPLETED.

B. INSTALL ALL WIRE CONTINUOUS FROM OUTLET TO OUTLET OR TERMINAL TO TERMINAL. SPLICES IN CABLES WHEN REQUIRED SHALL BE MADE IN HANDHOLES, PULL BOXES OR JUNCTION BOXES. MAKE BRANCH CIRCUIT SPLICES IN OUTLET BOXES WITH 8" OF CORRECTLY COLOR-CODE TAILS LEFT IN THE BOX.

C. SPLICE IN WIRES AND CABLES SHALL BE MADE UTILIZING MATERIALS AND METHODS DESCRIBED HEREIN BEFORE.

D. ALL CABLES AND WIRES PASSING THROUGH MANHOLES AND HANDHOLES SHALL BE FULL LOOPED INSIDE THE MANHOLE AND HANDHOLE AND SUPPORTED ON GALVANIZED STEEL RACKS.

E. MAKE ALL GROUND, NEUTRAL AND LINE CONNECTIONS TO RECEPTACLE AND WIRING DEVICE TERMINALS AS RECOMMENDED BY MANUFACTURER. PROVIDE GROUND JUMPER FROM OUTLET BOX TO GROUND TERMINAL OF DEVICES WHEN THE DEVICE IS NOT APPROVED FOR GROUNDING THROUGH THE MOUNTING SCREWS.

E. PROVIDE BRADY WIRE MARKERS WHERE NUMBER OF CONDUCTORS IN A BOX EXCEEDS FOUR.

3.06 WIRE COLOR CODE

A. COLOR CODE ALL CONDUCTORS. WIRE SIZES #8 AWG AND SMALLER SHALL HAVE INTEGRAL COLOR CODED INSULATION. WIRE SIZES #6 AWG AND LARGER MAY HAVE BLACK INSULATION BUT IDENTIFIED BY COLOR CODED ELECTRICAL TAPE AT ALL JUNCTION, SPLICE, PULL OR TERMINATION POINTS. COLOR TAPE SHALL BE APPLIED 1/2 LAP TO AT LEAST 6" OF THE CONDUCTOR.

B. COLOR CODE WIRES AS FOLLOWS:

CONDUCTORS	120/208V	277/480V	120/240V, 1ø	120/240V, 3ø
PHASE A	BLACK	BROWN	BLACK	BLACK
PHASE B	RED	ORANGE	BLUE OR RED	ORANGE
PHASE C	BLUE	YELLOW		BLUE
Neutral	White	White or Gray	White or Gray	White or Gray
GROUND	GREEN	GREEN		

3.07 MOUNTING HEIGHTS OF DEVICES

UNLESS OTHERWISE NOTED ON ELECTRICAL OR ARCHITECTURAL DRAWINGS, MOUNTING HEIGHTS OF DEVICES FROM CENTER LINE TO FINISHED FLOOR SHALL BE AS FOLLOWS:

SWITCHES:	44"
RECEPTACLES:	18"
TELEPHONE/DATA OUTLETS:	18"

NOTE: ALL DEVICE HEIGHTS FOR CONNECTION OF MACHINERY SHALL BE VERIFIED WITH OWNER.

END OF SECTION

NOTE:

① SHEET NOTES, GENERAL NOTES AND DETAILS SHOWN ON OTHER PARTS OF THIS SET OF DRAWINGS SHALL SUPERSEDE THIS SPECIFICATION SHEET UNLESS OTHERWISE NOTED.

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SHEET TITLE

ELECTRICAL
SPECIFICATIONS

NO.	DATE	DESCRIPTION
⚠1	11/14/23	PLAN CHECK COMMENTS

PROJECT #: A2306-AD441
DRAWN: RMB CHECKED: RC
SCALE: AS SHOWN DATE: 11.30.2023
SHEET

E7.0